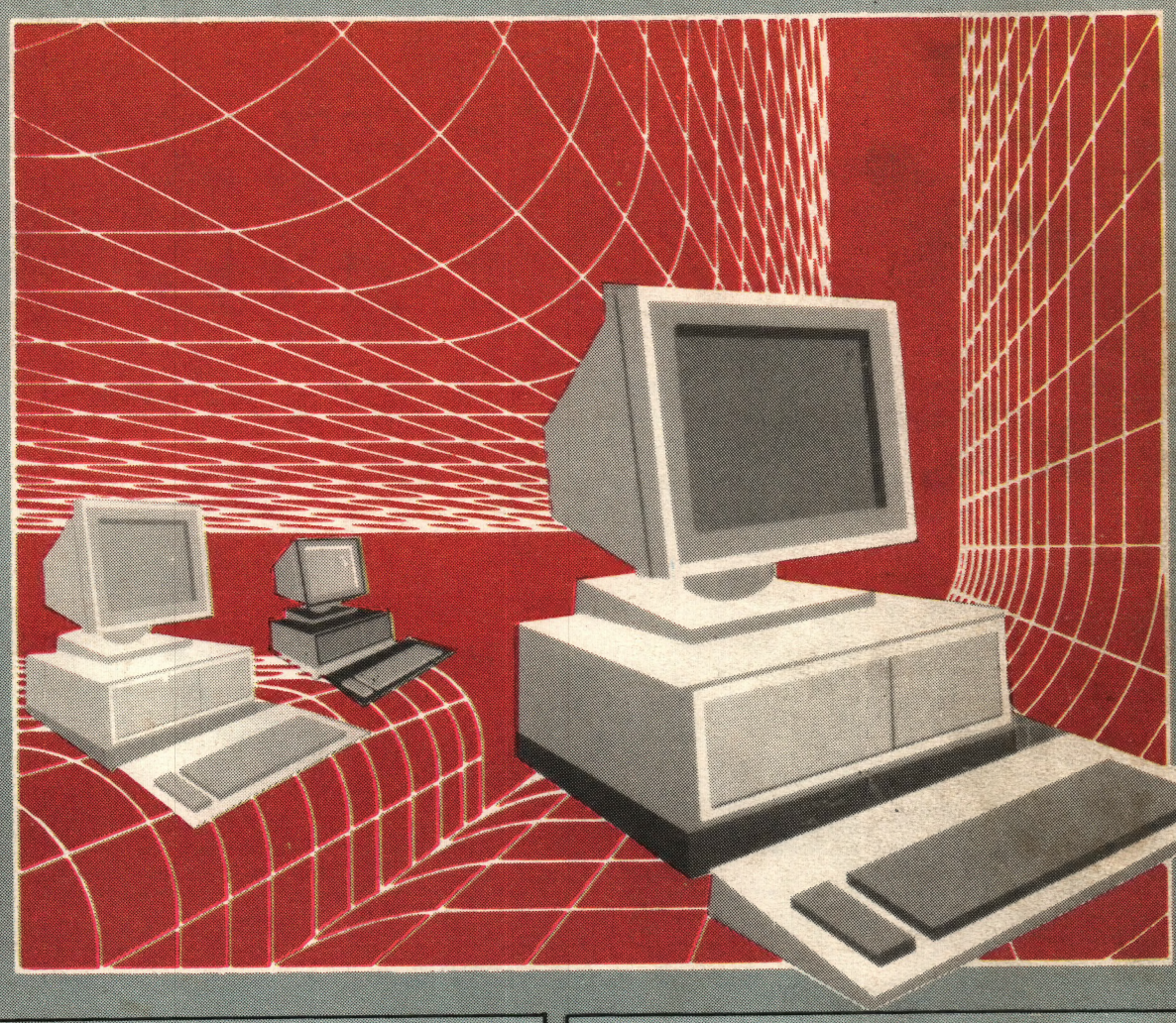
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COMPUTER SHOPPER™

MARCH 1986
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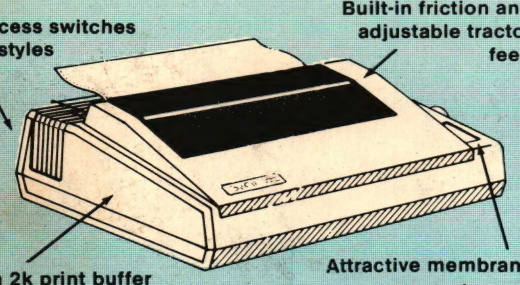
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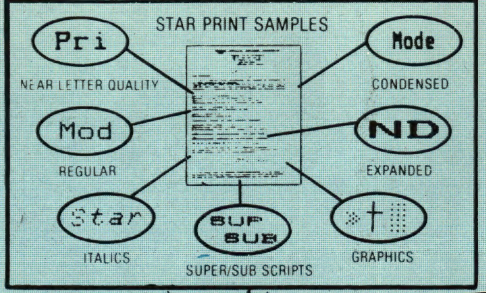
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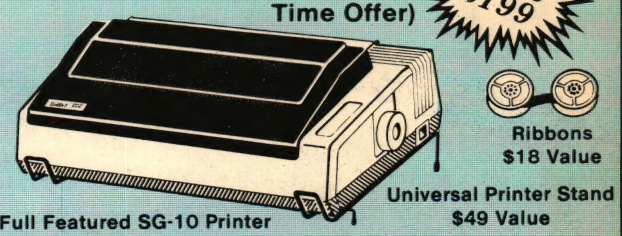


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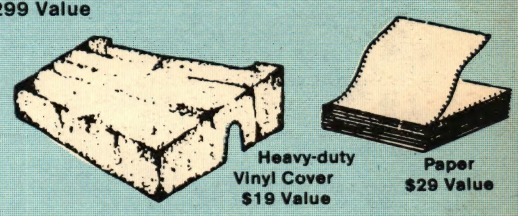


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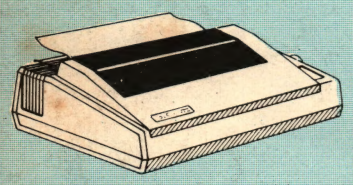
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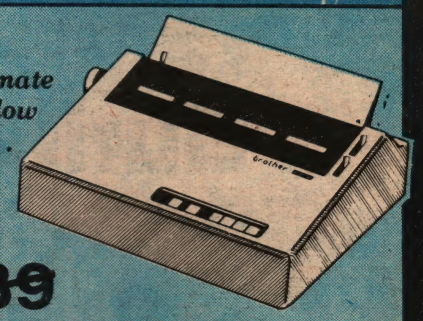
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Get the ultimate performance in a low cost daisywheel printer with. . .

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The NEW **brother** HR-10 gives you superb quality and advanced technology from the company that has long years of experience in electronic office machines. The HR-10 is not only a high quality unit but a printer that will last with a snappy 120 word per minute print speed. It uses the renowned **brother** cassette daisywheels for ease in changing and the **brother** mess-less ribbon cassettes. And with the text reprinting feature you can set the HR-10 to continuously print out whatever is stored in the 2k memory buffer — all this at the touch of the front panel control. Control codes emulate Diablo 630 codes for universal compatibility with most software. Other standard, time-saving features include super and sub scripting, automatic underlining, and bold printing giving your printout a professional quality cleanliness. The HR-10 is capable of printing most 4 part forms and accepts a paper width up to 11½ inches. This new addition to the **brother** HR series represents an outstanding value for a personal daisywheel printer.



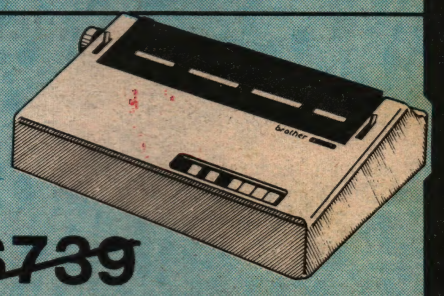
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brother's HR-25 daisywheel printer has been specially engineered to keep pace with your high volume while producing clean, clear pages of the most beautiful letter quality. Since the HR-25 incorporates a 3k buffer and can print out bi-directionally at a rate of 23 cps, output will never lag behind demand. Once into the buffer, information will be held for repetitive printout with the text reprint function — originals can be produced without end. Previously if you desired to stress certain areas of a text you had to underline the area or type it in uppercase letters. The HR-25's bold type function and red color printout make those stress points literally jump off the page, an especially welcome feature for important reports and letters. Character pitch is selectable among the settings of 10, 12, and 15 positions per inch in addition to proportional spacing. Other features such as super and sub script, auto underlining, carriage skip movement, and easy drop-in ribbon cassettes and daisywheels put the HR-25 ahead of the competition. It is equipped with either a centronics parallel or an RS-232C serial interface and DIP switches conveniently located for easy access, the HR-25 is easily adapted to your computer system. With **brother's** renowned reliability and easy add-on accessories (cut sheet feeder, tractor feed) the HR-25 will increase your office efficiency to unexpected levels.

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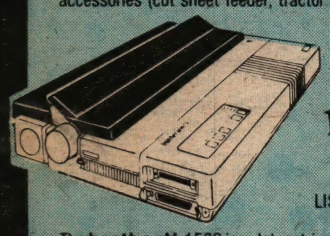


For the high output office get the. . .

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One of the main concerns in a high output office is putting out the work required without concern. **brother's** HR-35 will not only print out whatever is on your word processor's mind with the finest daisywheel beauty, but will print it out with a speed (32 cps) and accuracy that will keep your work moving in the right direction. Because the HR-35 incorporates a big 7k (23k optional) buffer memory, your computer will be free for other operations almost as soon as you give it the print command. And that buffer won't stay full for long, thanks to HR-35's 32 character per second print speed and bi-directional logic seeking carriage movement. But the HR-35 does not give up efficiency for speed. Since the printer head comes to a full stop at each strike zone, the high quality of the daisy wheel is taken full advantage of. HR-35 presents you with a host of other welcome features such as two color and bold printing, just the thing to make your text stand out. Extras include super and sub script function, auto underlining, proportional spacing, text reprinting, clear buffer and easy to use front panel control for all the main operations. HR-35's back panel allows either centronics parallel or RS-232C serial interface connection. DIP switches are easy to access and attachable options such as the tractor feeder and cut sheet feeder offer increased utility. And it goes without saying that the HR-35 uses exclusive **brother** daisywheel cassettes and ribbon cassette systems for simpler, mess-less changes. **brother** HR-35, a high output printer.



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The M-1509 also incorporates a number of cost- and labor-saving features. The large memory buffer releases the computer for other tasks while printing, an optional cut sheet feeder reduces paper-handling time, and the one-inch paper cut function economizes on paper. In addition, the M-1509 is supplied with character sets and control codes compatible with those of the IBM PC and the Epson FX series printers, for easy interfacing with a broad range of computer equipment.

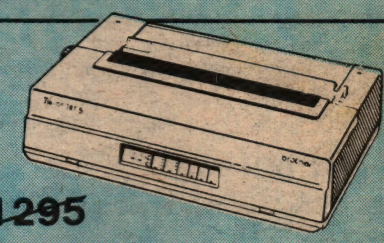
Above all, the M-1509 is designed for people. It is exceptionally slim and light, with conveniently consolidated controls, allowing it to fit easily into a fully-equipped work station without wasting either office space or valuable operator time. It is also quiet – a fact which, though often overlooked, is of crucial importance in maintaining an efficient, industrious office environment.

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TABLE OF CONTENTS

Curing PC Clone Confusion



- Laymans Guide To AI
- New Atari 1040 ST
- CES Roundup
- Understanding The TI PC

ARTICLES
PC Version of Roadsearch And Roadsearch-Plus . 103
New Time Management Packages 105
"Grasp" Software Technology 105
Grafix Connection Program For New Three Dimensional Graphics Software 106
Ashton-Tate Assists FBI In Investigation 106
Encyclopedia On CD-ROM And Philip's CD-ROM Now Available 108

APPLE
Ask The Guru 55
Apple's New Color Monitors 55
DataGraph 2001 56
GATO Submarine Simulation 168
New Ribbon Re-Inker For Apple Imagewriters . . . 170
Master Works — Integrated Programs For Apple II 171
Preparation For The SAT 172
Apple II Pascal Software To Support Unidisk 3.5 Disk Drive 174
Apple Computer Offers Schools Trade-In Program 176

MACINTOSH
New Macintosh Offers Increased Speed, Memory, Storage And Expandability 57
MacUniverse 58
QuickStick 58
Wheels For The Mind 58
MacViz Video Imaging System 150
Macintosh Apple Talk File Server Software 152

COMMODORE
Inside Commodore 61
Amiga? Todavia No... (Translation: Friend? Not Yet...) 61
"The World of Commodore III" — The Show 61
Quantumlink And Viewtron 109
Book Shorts 116
An (Un)Biased View of Viewtron 121
Mindwheel Review 126

ATARI
Applying The Atari 63
Atari Help 63
Atari Book Reviews 64
Atari Introduces 1040ST Sends 520ST To Chains . 64
Computereyes Graphics 9 Mode Compatibility For Atari Computer 64

ATARI ST
Atari 520ST Double Sided Boot Disks 65
Free Software For The Atari 520ST 65

SANYO
The Silver Box 69
Speed Racer: MichTron's Grand Prix 69
Reviews Of Newpoker And Solitaire: A Reviewer's Dream 70

TANDY
Toward The Ultimate Communications Program . . . 73
COPYCAT 4.16 For The TRS 80 Model III All 4's . 73
New Surge Protector 74
UDS Gets $3.5 Million Contract With CompuServe 74

TEXAS INSTRUMENTS
Book Review, Understanding The TI PC 75
First Annual LA 99/4A Expo 75
Randy's Ravings 76

TIMEX-SINCLAIR
Timex Sinclair Survival Column 77

MISCELLANEOUS
A Laymans Guide To Understanding AI, Part I . . . 79
Probots And People — Robot Hobbyists 80
New Dial-Back Computer Security Device 169
"(C)" As An Invalid Notice of Copyright 174
BSE - Microsoft's Hidden Word Processor 175
Checks & Balances: Finance System For Both CP/M And MS/DOS 177
Certification Exam For Computer Professionals by Mail 188

OTHER
Showcase . . . . . 212, 214, 216 & 218
Coming Events 196
Bulletin Board . . . . . 190, 191, 192 & 194
Classified Index 221
Users Group . . . . . 198, 200, 202, 204, 206 & 207
Service Directory 240
Advertisers Index 6
Software Shopping List . . . . . 208 & 209

THINGS TO COME

- Spotlight On Business — Real Estate
- Hard Disk Backup — Is The Need Being Met?

— New Column —

- T.I. Forum by Ronald Albright Jr. and Jonathan Zittrain

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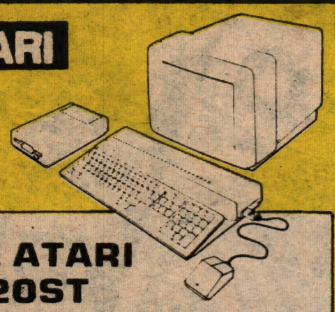
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HippoWord	75
Hippo-C Compiler	65
Hippo Disk Utilities	44
Ultima II	49
H & D Toolkit	29
H & D Database	69
H & D Forth	39
Zork I	33
Zork II or III	38
Hitchhiker's Guide	33

PRINTERS

OLYMPIA. NP	$285
OLYMPIA. RO	344
OLYMPIA. Compact 2	349
Juki 6100	389
Juki 6300	699
Silver Reed EXP550	409
Brother 1009	149
Star SG-10	239
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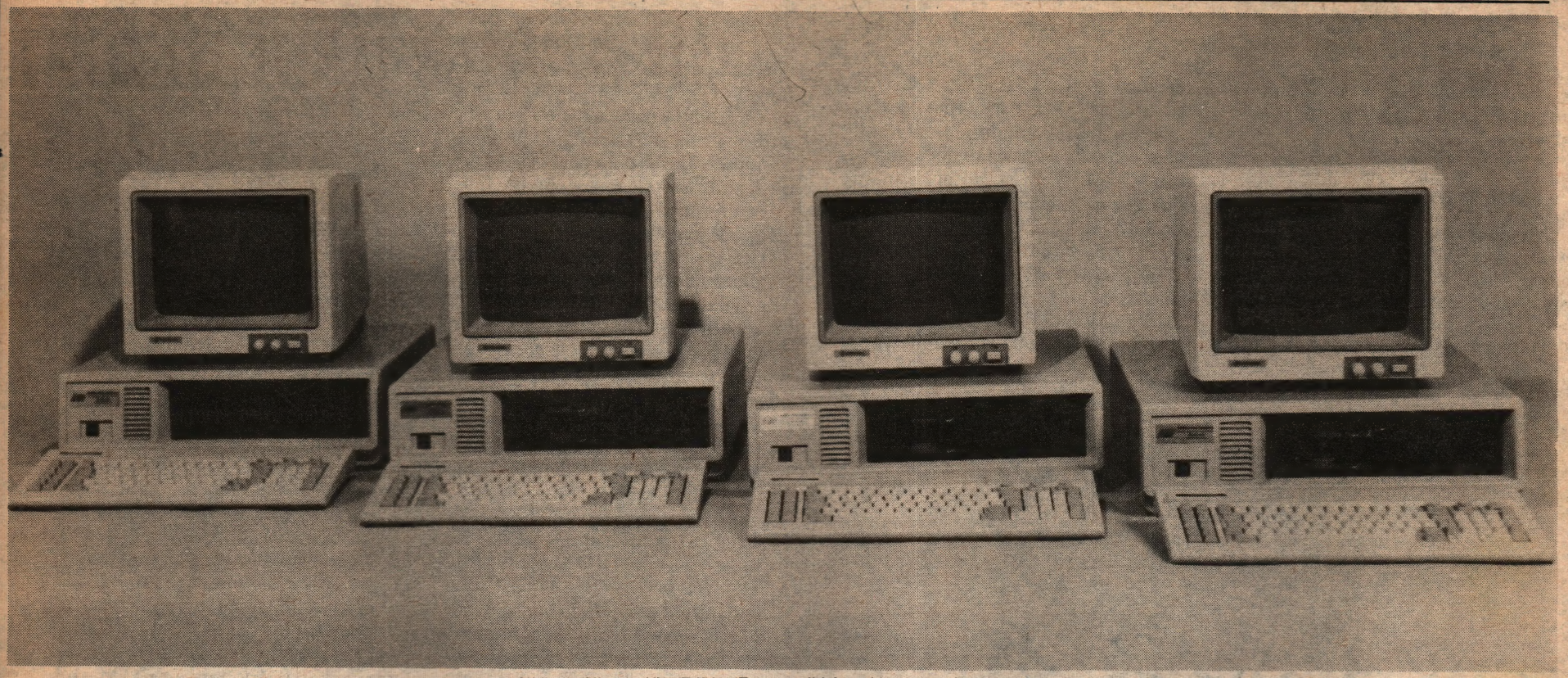
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Wyse WY-50 Terminal	$449
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Qume QVT-101 Terminal	298
Qume QVT-101A Amber	325
Amdek 300A Amber Monitor	139
Amdek 600 Hi Res RGB	409
Sanyo CRT-30 Green	98
NEC JC-1460 RGB	298

ADVERTISERS INDEX

A B Computers 201
Advanced Intelligence Tech. 189
Advanced Logic Research 217
Afton Computer 245
Altex Electronics ..... 82 & 83
American Computer & Peripherals, Inc. ..... 210 & 211
American Design Components 22
American Semiconductor 241
Arlington Computer Products ..... 34 & 35
Atlantic Computer Products 107
B C E ..... 67, 98, 99, 158 & 159
B.G. Micro ..... 42, 43 & 44
BTE, Inc. 91
Bulldog Computer Products ..... 18 & 19
C.J. Computers Corp. ..... 84 & 85
CSS Lab, Inc. 246
Communications Electronics 38
Competitive Computer Components 265
Compuclassics 274
Computer-Age, Inc. 149
Computer Component & Service Center, Inc. 215
Computer Connection 267
Computer Creations 111
Computer Mail Order 39
Computer Parts Galore ..... 258 & 259
Computer Parts Mart 199
Computer Products & Peripherals Unlimited 173
Computer Products United 247
Computer Shopper Mart ..... 212, 214, 216 & 218
Computer Solutions 21
Computer Warehouse 36
Computer Wholesale of N.Y., Inc. ..... 118 & 119
Conroy-LaPointe ..... 24 & 25
Continental Peripheral Unlimited 20
d & d Discount Computers 45
Disk World ..... 40 & 264
Diskette Connection 275
East, Inc. 165
East Coast 46
Eastern Enterprises, Inc. 252
Electrified Discounters 183
Electronic Parts Outlet ..... 248 & 249
EMCO 145
Emerald Components International ..... 50 & 51
FCG Information Systems, Inc. 72
Floppy Disk Services 276
Foundation Systems 193
G & L 115
Gemini Electronics ..... 32 & 33
Godfather's Used Computer Syndicate ..... 47, 48 & 49
Guenther Computer Products 146
H & R Corporation 213
Harmony Computers 23
Horn Computer International, Inc. 95
I C Express 28
ISHVAR Technology 89
JDR Microdevices ..... 138, 139, 140, 141 & 142
Jameco Electronics ..... 186 & 187
Kengore 197
L-Com Data Products 68
Leo Electronics 157
LogicSoft 12
Lolir Lectronics Corp. ..... 253, 254 & 255
Lyco Computer Marketing ..... 16 & 17
MFG, Inc. 153
Magnetic Media of New England 37
Magtek-Media Data Supplies, Ltd. 59
MicroComputer Concepts 261
Micro Interfaces Corp. 185
Micro Peach Computers 219
Microprocessors Unlimited 129
Micro Supply Organization, Inc. ..... 250 & 251
Micro Warehouse 181
Midwest Micro-Peripherals 2, 3, 26, 27, 52, 81, 127, 220, 270 & 271
MIX Software 195
N.D.R.C. 71
Omnicom 137
Otto Electronics 163
P C Network ..... 242 & 243
Printers Plus 41
Proto PC 273
Ramsey Electronics 244
Sabet Electronics 179
Scottsdale Systems Corp. 5
Sharpe Systems Corp. 29
Shepherd Marketing ..... 11 & 260
Southwest Educational Media Foundation 266
Super Price, Inc. 203
Supreme USA, Inc. 205
Tech Personal Computers 78
True Data Products ..... 268 & 269
Tussey Computer Products 31
USA FLEX ..... 226 & 227
U.S/DISK 88
Unitech 60
United Computer Resources ..... 232 & 233
VF Associates 133
V.I.P.C. 272
Wholesale Outlet 30
Wolff Computer & Electronics ..... 256 & 257
Z-Nix Company, Inc. ..... 262 & 263





Midwest Micro's MWXT-IBM/XT compatible's sold as complete systems

Curing PC Clone Confusion

by Stan Veit

As market leaders, the IBM PC, XT and AT computers have inspired countless imitations commonly called "clones." Ads for these computers fill the ad pages of every computer magazine. Many reviews attempt to define them in terms of the "real thing," giving rise to measurements of "IBM Compatibility." The whole thing is so confusing to potential buyers that many will only buy the IBM originals, or one of the clones sold by major computer suppliers, thereby possibly missing out on excellent buys.

The so-called clones range from MSDOS computers sold by major manufacturers to kits of parts for do-it-yourself PCs, XTs and ATs sold by small importers of Asian computer products.

The prices of the clones range from 90% of the price of the original IBM machine down to 40% of the original price. The standard of quality ranges from superior to terrible with many steps in between.

Since so many of these clones are advertised in *Computer Shopper*, our readers often call or write for help in judging the merits of some of the equipment offered in the ads. This is very hard for us to do because we simply have not used most of the equipment offered by all our advertisers. Our only concern is that the merchandise is not misrepresented and that the vendors ship what they sell in a timely manner. In spite of this we can offer a great deal of help to the reader in understanding what is being offered and to help them to form their own opinion.

Classifying The Various Clones

There are several types of computers that may be classified as MSDOS computers.

IBM Computers "The Real Thing"

First are the IBM PC, PCjr, XT, AT produced by IBM and sold through authorized dealers, IBM product centers, or by direct sales engineers. The prices for these are set by IBM at their Product Centers. Prices at dealers may differ somewhat being either higher or lower, depending on supply and demand. Often dealers will supply an IBM computer that has been "enhanced" by themselves. They will take a machine supplied by IBM with the minimum amount of memory and one floppy disk drive and add extra memory chips, and expansion boards, a second floppy disk drive and possibly a hard disk. They will also sell you a video monitor, most often, not an IBM unit and a printer with cables.

Some will throw in some software to sweeten the package. The resulting "System" price can be most attractive, or you can get stuck! How do they get away with this? Simple, IBM has completely unbundled their computers. What you get with a basic IBM computer is a keyboard and a box containing a main assembly equipped with a certain amount of memory and one or two floppy disk drives, with the XT and AT you get a hard disk. You also get a built-in power supply, and some manuals. The essential video monitor, additional drives, I/O boards, video adapter (either monochrome or color), and graphics boards, cables, PCDOS operating system, application software are all extra.

If you have done some research you will find out that some of the best plug-in boards are not made by IBM but by third parties like AST, Techmar, and many others.

Now we have explained how a computer vendor can set a system in an almost infinite variety of configurations designed to make his package look attractive to the buyer and produce the most profit. This is not necessarily bad, if first class boards and drives are used you can get a very good deal from a dealer's packaged system. The problem today is that there are clones of the popular boards as well clones of computers. If you are not careful you may get an Asian clone in place of the well known American board. That may be the price edge in a bargain.

Gray Market Computers

A Gray Market computer is a real IBM (or other major brand) sold by a non-authorized dealer. You can save money in this deal providing you don't need an authorized dealer for service or hand holding. In some cases the Gray Market dealer will provide you with good service, in others he sells cheap for a quick turnover and never wants to see you again.

Where do they get the machines? From authorized dealers of course. Dealers must meet a sales quota to keep the franchise. When they get stuck with excess stock, the Gray Marketer comes along with cash to buy out the stock. Since the Gray Market operator pays cash to the dealer, he needs to make a quick turnover to extract his profit and free his investment for another deal. For this reason he is content with a small markup for a fast sale. You can profit from this operation providing you know what you are buying.

High Class Clones-Compatible MSDOS Computers

Soon after the introduction of the IBM PC desk top computer, the Compaq company came out with the first PC compatible computer. It was not a clone because it was a transportable machine (they called this 32 lb box a portable!) and IBM had no such machine. In fact you might say that the IBM portable was a Compaq clone. The Compaq was a computer which was in every sense as good as the PC. In fact Compaq had video circuits capable of either monochrome or color while the IBM PC required the use of two different video boards to make this choice. Compaq was a huge success and also came out with desk top computers. They have maintained their position by introducing advanced features and having computers available at times when IBM could not meet the demand.

Other American made PC clones soon appeared such as Sequia, Columbia, Eagle, Corona, Tandy, AT&T. Some of the smaller companies did not last because of legal problems with IBM, or because their product had technical problems. Sequia, Columbia and Eagle are out of this business. Corona makes computers for several other electronics companies. Tandy sells their clone through their own retail stores while AT&T is just starting to really become a factor in the PC market after first selling super micros of their own design.

Today big companies like AT&T, ITT, Sperry, Hewlett Packard, Heath/Zenith, Fujitsu, Epson, Tandy and Canon all produce IBM PC compatible computers. Some have features that IBM lacks such as I/O ports on the main board, more memory and faster clock speeds, others have smaller footprints or sell for much less than IBM. If you want to be safe and yet buy a non-IBM machine, you will be safe with any of these computers. The price spread is great but be careful shopping and you can get a good deal. Tandy runs specials on their machines that are often outstanding values.

continued on page 8

Curing PC Clone Confusion
continued from page 7

Watch the ad pages of *Computer Shopper* for bargains on these machines.

Can Any Clone Be 100% IBM Compatible?

No clone can be 100% compatible with the IBM machine it is copied from. The IBM product uses a version of MSDOS called PCDOS which is supported by a Read-Only-Memory (ROM) copyright by IBM. In this ROM is a version of BASIC and a lot of other routines used for booting the system and additional housekeeping functions. This is called the ROM BIOS (Basic Input/Output System). When you turn on an IBM PC/XT without installing a DOS disk, BASIC will be loaded into the computer RAM memory from the ROM. When you use the disk operating system (PCDOS) and then load BASIC (or BASICA) you are still using the ROM BASIC but now you are adding the disk operating routines.

Other MSDOS computers do not have the same BIOS and the same ROM. They use a version of MSDOS licensed to them by Microsoft and they load a version of BASIC equivalent to IBM BASIC, but loaded completely from a disk. This is called GW BASIC.

If software calls routines in the IBM ROM and uses these routines, it will not run on clones that lack the ROM. Most software developers now realize that IBM computers are no longer the entire market and they try not to use any ROM calls that would make their programs incompatible with IBM. However, the only way to be certain of compatibility is to try the software on the computer.

Non-Compatible Work-A-Likes

Some computer manufacturers decided to meet IBM head on with computers that used the MSDOS operating system and the Intel family of 16-bit CPUs but were not compatible with IBM PCs. Notable among this group of machines were the TI Professional, DEC Rainbow, Victor 9000, Epson QX-16, Tandy Model 2000, Sanyo 555 and Apricot computers. Some of these were excellent computers with desirable features and they have built substantial followings.



Kaypro PC

They ran much the same software as the PC and clones, but it had to be formatted specifically for the individual computer make. In the case of the TI Professional it runs much of the same software as IBM, plus some written for its own features. The Sanyo 555 has been one of the great success stories in PCs. Selling for less than any competing machine, it came with a full package of software and became popular in spite of non-compatibility with IBM. The Sanyo 555 is a strange machine in some respects. It will often run IBM compatible software but the screen image will be completely incorrect. Sanyo has now come out with a video adapter board that makes the 550-series more compatible with the IBM PC.

The Tandy 2000 is another non-compatible MSDOS computer. It is a true 16-bit computer using an 80186 CPU running at 8MHz whereas the IBM PC is really a 16-bit computer running in an 8-bit bus at 4.7 MHz. The Model 2000 has RAM memory of 256K expandable to 768K while the PC can only be expanded to 640K. The graphics capability of the Model 2000 is 640 by 400 pixels while the PC is 640 by 200. Tandy has provided lots of the most popular MSDOS software but you are still dependent on them for your choices. The Model 2000 is not compatible with the complete range of PC/XT/AT software and when a new product comes out you must wait for it to be adapted for this computer. If this does not bother you, the Tandy 2000 is an excellent value.

Tandy also makes a line of fully compatible clones.

The Apricot computers are made in England and are ranged from a low priced entry model the F1 at $995 up to a full AT clone the XEN. The Apricot range are MSDOS computers which are not quite IBM compatible due to the use of 3 1/2" disks and other differences. Apricot has provided a wide range of software for their machines but it is not widely available in the United States.

Outside of the Sanyo 555, the TI Professional and Tandy 2000, the history of non-IBM compatible MSDOS has been sad. Even DEC, the second largest computer company has had little success with them. Victor's Model 9000 had some excellent features but was a marketing failure due to non-IBM compatibility. The same with the Epson QX-16.

My advice to a buyer would be to leave this class of computers alone, except possibly for the TI Pro and the Tandy 2000 which have much to recommend them. Most of the manufacturers have decided that it is better to quit than fight and joined the PC clone bandwagon. This group includes Tandy, Epson, and Sanyo all of whom now build 100% IBM PC/XT/AT compatible computers.

What Do You Need In Your PC Compatible?

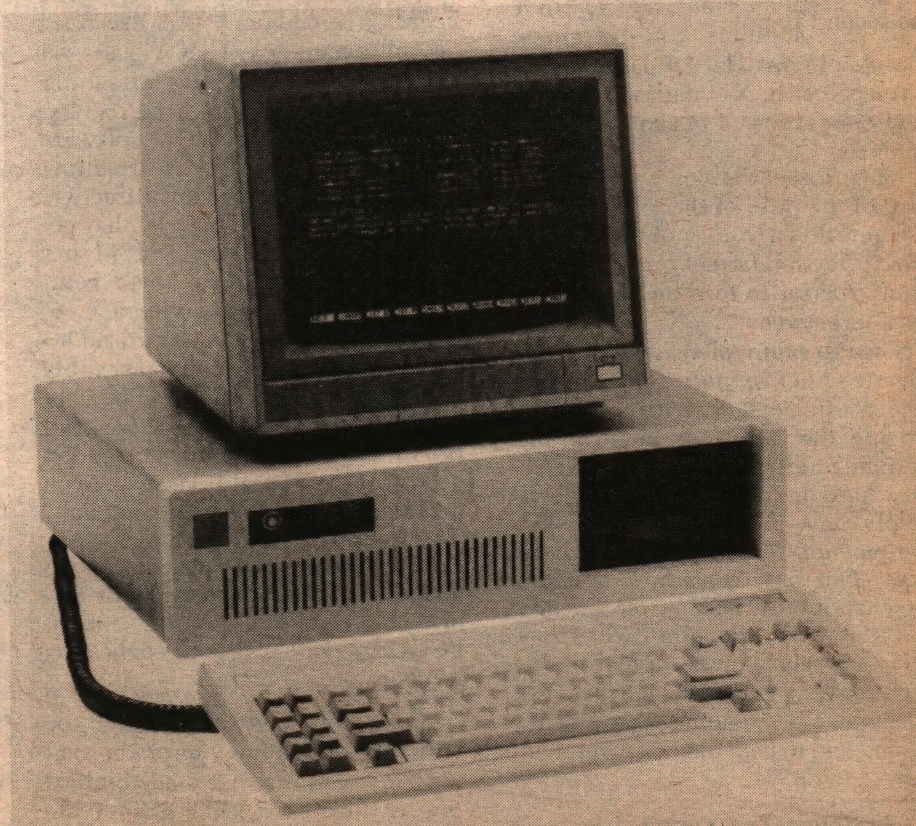
When you open the magazines to compare the various ads for clones you notice that the desciptions are all different. Each vendor offers a different system from all other advertisers and at a different price. Trying to sort them out is like trying to map a bowl of spaghetti, with one added handicap--you don't even know what you need.

Let us examine some of the requirements for a modern PC computer.

How Much RAM Do You Need?

To start with you need lots of RAM memory. Exactly how much is lots? Well according to Veit's Law, you need more than you have. (No matter how much that is.) Years ago we had 8K of RAM and we thought that was a lot, then came 16K boards, then 32K and 64K and so on. Each time we gained more RAM, the software publishers upped the requirements on us. You see they kept giving us more complicated applications software requiring more RAM. When I bought my system I started with 320K of RAM, more than I would ever need, or so I thought. Now there is a lot of software I cannot run because it requires 512K or more. I am going to upgrade to the present limit of DOS 3.1 which is 640K. This limit is about to go the way of all restrictions on RAM and megabytes of RAM are now common. My old Main PC Assembly (main board) only held 64K, the rest of my RAM is on plug-in boards taking precious slots. Today the smallest main board has 256K of RAM using 128K chips. You can get memory on the main board up to 640K by using 256K memory chips. Many vendors offer, "256K expandable to 640K on board" what this means is you get a board with 256K, if you want 640K you have to remove the chips and replace them with 256K RAMS at your expense. Some vendors offer 640K to start with and that is a much better deal. There are also main boards that will allow up to 960K on board. Remember the key term in describing memory capacity is "ON-BOARD" if you have to add extra

continued on page 9



Kaypro Starter Kit for $595 builds compatible clone

Curing PC Clone Confusion continued from page 8

boards to gain memory expansion it will cost you much more than just the cost of more chips.

Power Supply Requirements

The next thing to look at is the size of the power supply. The original IBM PC power supply had a capacity of 70 watts. When you started to add extra expansion boards or internal hard disk drives you soon exceeded the power capacity of this switching supply. For an internal hard disk you need at least 135 watts, 150 watts is better and 200 watts still better if you want to add several component cards. When selecting your system be sure that the power supply is approved by the U.S. Underwriters Labs. In California you better have state approval as well as Los Angeles city approval. If you cause a fire with an unapproved power supply you not only lose your computer and possibly your home, but you are guilty of violating the law. Beware of bad power supplies.

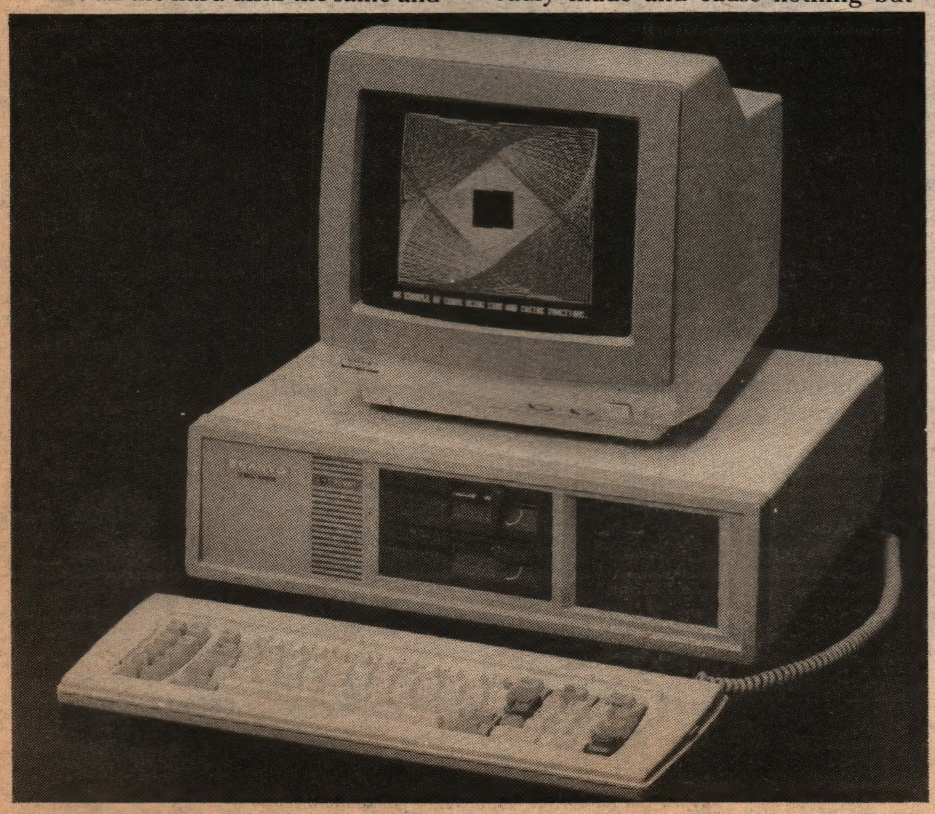
Floppy Disk Drives

Now let's talk about floppy disk drives. You need at least two of them. Don't ever buy a computer with one drive, never! The original PCs came with full height floppy disk drives. Then half-height became the most popular. Now you can put two floppy disk drives on one side and a hard disk on the other. You could also install an extra disk controller board and have four floppy drives. This is a very bad idea because it is a lot of bother to keep things straight, besides hard disks are so cheap now that you should have one if you need more storage than two floppy drives offer you. Don't let them sell you one floppy because you have a hard disk. You still need two floppies or you will be cursing yourself from now until you buy the second floppy.

Hard Disk Drives

Are all the hard disks the same and why do they sell for such a wide range of prices? This is a question I get asked everyday. The answer is no they are not the same, but I can't tell you which is the best to get right now, there are too many brands coming from far away places. Some of the well known U.S. brands have been driven out of business by a kind of Greshams Law (cheap bad drives drive out good high priced drives). Perhaps you can get a bargain, perhaps not. You are usually offered a "deal" by the vendor including a 10, or 20Mbyte drive for a small extra price increase. By all means, look the gift horse in the teeth. A drive that goes down with all your data on it is bad enough, but one made by Mamasan that no one will fix is much worse. If the drive comes from the Orient, be sure it is a brand you have heard of, one that has repair facilities in the U.S. If you can't get a well known drive, skip it and put one in later when you really need it.

Any PC/XT/AT is a box into which you plug circuit cards to add the facilities that IBM never gave you on the main board. The most important of these are I/O ports. Without them you can't get anything out of, or into the computer. You need at least one parallel printer port and one serial RS232C port (two is better). If you play games or use a Mouse you need at least two game ports. Some clones offer the I/O ports on the main board, but most follow the IBM scheme and require plug-in circuit boards. Here is where the combination board comes in handy. You are limited in the number of plug-in slots on the main board so a plug-in that has multiple functions saves precious slots. There are many combo boards made by well known American manufacturers like Techmar, Quadram, STB, to name but a few. There are also board clones as well as computer clones. If you buy board clones be sure you have the right to return them if they don't work or stop working. We have found some of these are exact duplicates of the originals and work fine, others are badly made and cause nothing but trouble. The copyright laws used to protect software do not cover hardware so it is easy for foreign copiers to duplicate the work of American firms in developing PC expansion boards. Although the bogus boards may work there is no firm to stand behind them when they fail. The mail order house that sells them will replace them during the warranty period, but what happens after that first 30 days or 90 days?



Sanyo MBC 880 Series - IBM Compatible



Epson Equity 1 — PC Compatible

Video Displays

People who have previously bought computers are amazed to find out that the video display does not come with a PC. They are used to buying computers without the video monitor but not without the video display adapter. There are color and monochrome video display adapter boards and some that contain both color and monochrome circuits.

The original IBM PC came with a high resolution monochrome video adapter (extra cost). It had excellent resolution for text when used with the IBM monochrome monitor, but no graphics capability at all. Later IBM came out with a color board that provided both graphics and text capability. The text resolution however was not very sharp and therefore a lot of users stuck with the monochrome board and video monitor. A U.S. company called Hercules came out with a graphics adapter that allowed the use of the monochrome card and monitor but also permitted monochrome graphics. This card became a de facto standard. Later IBM came out with an extended color graphics board. In the meantime many American manufacturers came out with excellent color graphics boards. AST, Techmar, STB, Sigma, Paradise, Hercules, and Everex are some of these board manufacturers. What do you get with a clone? Sometimes you get one of these American boards, but more often you get a copy made in Asia. Without seeing the video you have no idea how good it is so if you buy one of the clones be sure that there is provision in the deal to return it if you are not satisfied. Be sure that the software you want to use is compatible with the video adapter board you buy, or get as part of "the deal." If not you are in trouble.

Video Monitors

In buying monochrome monitors try to get one with a high resolution specification and a bandwidth above 15MHz. How can you tell if your monochrome video monitor is good? Simple, just look at it for a period of time. Is a green monitor better than an amber one? That is up to you, I like white on black but you seldom see them these days.

There are two kinds of color monitors, NTSC composite and RGB. NTSC composite is like a TV and does not have very good resolution for color graphics. RGB is mostly what you get these days even with a PC clone. Often the monitor included in "the deal" special price is not too good. Find out what they are giving you and if you can return it and pay extra for a better monitor if you don't like the video. You are going to look at it for a long time, so get video that looks good to you. If you are not sure about the video monitor buy the clone without the monitor and then buy one of the better brands. Princeton Graphics HX12, or SR12; Amadek Color 600, 700, 710; Taxan 640 IBM. Zenith, Toshiba, are a few of the better video monitors. You may be saving a lot of money on your computer,

continued on page 10

Pixels And Bandwidth Improvement

by Les Solomon

Last month, we discussed some numbers involved in graphics displays. This time around, we will discuss some details of what makes a graphics display tick and show you an interesting trick that some enterprising hardware experimenters can use to improve the apparent bandwidth of their video monitors.

In discussions of computer-related subjects, several people have asked why many computers and video displays seem to have different "looks" — i.e., why some displays are smooth looking while others seem to be created from blocks of color and sort of "patched" together to form a crude image.

Basically, the "smoothness" of a display depends on how much memory the manufacturer wants to devote to the display, and how high the resolution of the video monitor. In most cases, the computer or plug-in board manufacturer just supplies a video output signal, and leaves the choice of the video monitor up to the system user. (Last month, we showed you how to determine what bandwidth video monitor your system could use.)

From the manufacturing viewpoint, it is not just a case of adding a bunch of relatively low-cost memory chips, it is also a case of "real estate" (the increased pc board space required for the added chips) and possibly a somewhat larger power supply to handle the extra chips, all of which probably means a larger (more expensive) enclosure. Every added element raises the manufacturing cost of the system, and eventually any cost increases are reflected in the price paid by the final customer.

Now, let's get on with the graphics discussion.

When you look at a video image displayed on a CRT, you are actually observing the image through a form of screen — where the "quality" of the displayed video image depends on the spacing of "holes" horizontally located across the screen. If, for example, the holes are widely spaced, then the viewed image will be broken up to the point where it may not even be recognizable.

As the holes become closer spaced, the viewed image becomes clearer.

The "holes" in a CRT image are called "pixels" — an abbreviation for "picture elements," and the more pixels per line (called "spatial resoltion"), the clearer the displayed video image becomes. A typical TV receiver has about 380 pixels on each horizontal sweep line, while the computer-generated portions of some science-fiction movies (portions of Star Trek, Star Wars, Last Starfighter for example) have as much as 3000-4000 pixels per line, which accounts for their very smooth (and very real looking) image.

A pixel can have only one brightness component, even though a large pixel can cover both bright and dark areas of the original image. In low-resolution systems, this is what accounts for the "blocklike" look of the pixels that make up the image.

The brightness of a pixel should correspond to the actual brightness of the portion of the scene it is viewing at that instant.

If the display is in monochrome, then a particular pixel is either turned fully on or fully off (this requires only one bit). If three bits are used per pixel, then the associated pixel can appear in any of eight brightnesses (000 through 111) which spans the gamut from black, through a gray scale, to white. In this case, each pixel requires three bits of data (three times more memory than a simple one-bit system).

Obviously, the more brightness bits used per pixel, the more memory is required (for example, to generate 256 levels of brightness, eight bits are required.)

A high-resolution image (hundreds of pixels per line) will also use an extensive gray scale to display the better image — especially if the image is in color. Thus, the better the displayed image, the more memory required. This was also discussed last month.

But, when you get down to the nitty gritty, it is the color CRT that determines the final bandwidth. Actually it is the electron beam "spot size" on the screen that does the trick. Obviously, the smaller the spot size, the better the resolution.

There are three basic CRT techniques currently used in computer color displays — the commonly used "delta" approach in which three electron guns (and their associated color phosphors) are arranged in a triangular (delta) format, the precision in-line where the three electron guns are arranged side-by-side in a horizontal row, and the Sony Trinitron CRT in which one electron gun creates three independent electron beams.

The precision in-line approach was

continued on page 14

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Sanyo MBC 990 is AT clone

Curing PC Clone Confusion

continued from page 9

spend some of it on a good video monitor.

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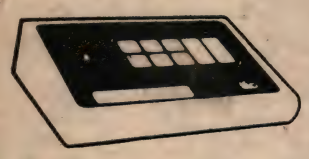
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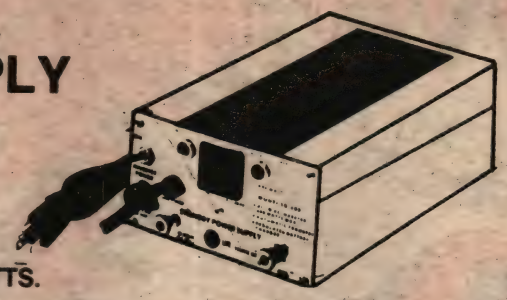
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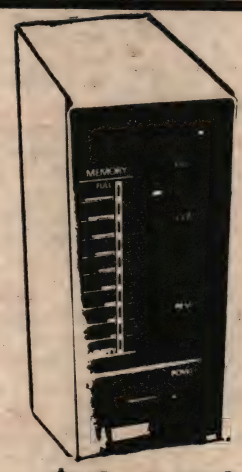


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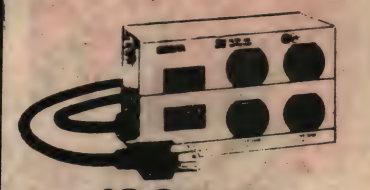
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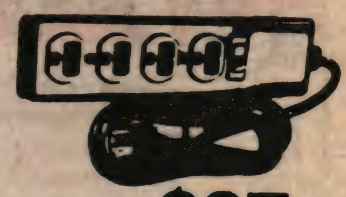
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Editorial

By Stan Veit

Please notice the new masthead which indicates that there have been a number of changes in *Computer Shopper*. These have been designed to improve our organization and to improve our publication.

Mr. M. Frank Billings has been appointed by our Chairman Glenn Patch, as President and CEO. Mr Billings will be our guide and mentor as we evolve from a family run business into a major publishing company. This is a period during which any business can run aground and we are lucky to have a steady hand at the helm.

Linda Rew formerly Asst. Publisher has been appointed as Publisher of all our magazines. As a person with a long term of service with the company she will assure the continuity of Patch Publishing's policies and long term relationships with our readers and advertisers.

I have been appointed as Assistant Publisher as well as Editor of *Computer Shopper*. I will report to Frank Billings and Linda Rew, but I will continue to report to you, our family of readers and advertisers. In the almost three years since I came from Computers & Electronics to *Computer Shopper*, I have been greatly helped by your letters offering me advice about what you would like to see in this magazine, what you liked and what you didn't like. Please keep the letters coming and I will try to respond to you by mail, editorial comment and by phone.

Reading your letters each month, I find one theme in almost all of them, you can't find us on the newsstand in your location. Well, we put a lot of issues out there for you to buy but sometimes the distribution is uneven. We have hired an expert on newsstand circulation, Mr. Jim Gerth. It will be his job to get the issues to you wherever you live. Write him if you need help in finding *Computer Shopper* in your locality. (Send in your subscription and you need never worry about that again.)

I attended the Winter Consumer Electronics Show in Las Vegas and I was pleased by the number of our readers who came up to our booth to talk with us and offer suggestions about *Computer Shopper*. We will be at the West Coast Computer Faire and our Guru, Don Lancaster, will try to be in our booth at that show. Stop by and talk with him, especially you Apple folks.

We have some exciting things in store for you in *Computer Shopper*. First, you have been asking for help with business software and advice on what to buy and use. Starting with the April issue, we are adding a SPOTLIGHT ON BUSINESS section. This section will examine specific fields of business and report to you on all the resources available in software and on-line services for that business. We will also list the hardware necessary to run the software. In this business section we will also run handy software listings of value to all businesses. Does this sound good to you? If so drop me a line and suggest types of businesses for us to Spotlight. We have Real Estate, Construction, and Direct Sales under assignment right now.

You will notice that we have an Atari ST section in this issue. This new system has grown to become a major computer and it rates it's own section. We hope to also have an Amiga section but we do not have the material, or the cooperation from Commodore. If there are people who can share their knowledge with other Amiga users, let them speak up and write articles for *Computer Shopper*.

We expect more articles on the Sinclair QL now that it has flown the ocean from England and more information on AI from Texas Instruments who is trying to educate us all on this important subject.

In the advertising section we will include *Computer Shopper* Mart pages for Software and Services. This will bring to your attention many smaller software publishers who now can not afford to advertise at standard page rates. Read these ads each month, gold is often found in small places. ●

LINDENHURST **by Corey Strongin**



Winter CES Show Roundup

by Stan Veit

I am writing this upon my return from the 1986 Winter Consumer Electronics Show in Las Vegas a show that used to be filled with computers, software and peripherals. In fact at least 40% of the show had been in this catagory during the past two years. This year was completely different. Only Atari and Video Technology Computers showed up from the ranks of computer manufacturers. There were some software publishers and hand held computer manufacturers and peripheral companies but the home computer industry was gone! Way back in 1979 when I attended my first CES and computers were shown in the basement, there were more computer exhibitors than this year.

The reason for this lack of exhibitors is the death of "home computers" as originally presented to the public as a panacea for ignorance. The advertising copywriters presented the home computer as a home utility and a necessary educational tool. Who can ever forget the poor kid returning from college, a failure doomed to a life of toil because he had never learned to use a Commodore 64. The public bought all this hype and then discovered that no one ever NEEDS a computer and its very hard to use one. Any other home appliance does whatever it is designed for just for the turning of a switch. A computer just sits there and blinks at you waiting. Go ahead dummy, do something. Who needs a smart machine that does nothing? Of course some of us learned and became computer enthusiasts. People like you and I are the foundation of the computer industry, but we don't buy our computer stuff from the chain merchants and appliance dealers who are attendees at this huge show.

Why then was Atari at the show? Well they have just decided to sell the 520ST through mass merchandisers like Kmart and Toys'R' Us. The model they will sell will also have an RF modulator for use with a TV and cost about $500. Not bad for Atari, but not so good for the computer dealers who launched the 520ST with a promise from Jack T that this machine would only be sold through computer dealers. I sat in a conference at Comdex in Atlanta and heard him make that promise. Oh well! Atari now says "we have a new 1040 ST for the dealers." "The chains will never get that one." Oh yeh!

Commodore did not exhibit at this show. A representative of theirs did appear at one of the seminars and told the people that Commodore didn't come because, "we have all the business from the chains already." Given the laging sales of Amiga that is an amazing statement. Incidently, we gave the Amiga a cover feature and a story based upon what we saw at the big launch and what Commodore told us. However we have yet to receive a machine for a hands-on, in depth review. We will eventually get one, but long before that our regular writers will have disected the machine for your information. This is very shortsighted on the part of Commodore. Do they realize how many people ask us for advice on which computer to buy? When someone asks me "Which do you like, the 520ST or the Amiga," I tell them that I own an IBM PC but many of the writers who work for me have selected the 520ST and think very highly of it. As for the Amiga, when they send us one, I will form an opinion. Until then its a good looking box that seems to make nice pictures and sound.

At CES, I spoke to many software publishers regarding the Commodore 128 and asked them if they had any software coming for this computer. The answers shocked me. They all said, no programs in the 128 mode. "Why," I answered, the reply was that they would only program in the C64 mode because that way the software would run on both machines. This is a sad situation. The C128 is a great machine for the price and it has capabilities far beyond the C64 (plus a much better drive speed). Why cripple this potential winner with obsolete software? Again I lay the blame at Commodore's hatch cover. They should be the ones to come out with a flood of C128 mode programs and establish this machine as the successor to the C64. Instead they are putting all their eggs in the Amiga basket and if that should fail, bye-bye Commodore. Looks like Commodore after Jack, lacks the will to win and the brains to stay. ●

Pixels and Bandwidth
continued from page 10

developed to reduce the convergence problems associated with the older delta system. If you have ever tried to converge a color-TV that uses a delta CRT, you know the problem there.

The Sony Trinitron uses one electron gun to produce three independent electron beams arranged in a horizontal line (like the precision in-line system), except that the Trinitron features a very small spot size on the CRT phosphor plane. As previously mentioned, the smaller the spot size, the better the display resolution.

There is another CRT element that also determines spot size and this is the shadow mask (holes), or aperture grille (vertical slits) used to direct the three electron beams to their respective color phosphors. Obviously, the smaller the hole (or aperture) spacing, the higher the resolution. However, there are problems here also.

Since a shadow mask allows only 15% of the electron beam energy to pass (it is mostly metal with holes punched in it), and the aperture grille allows a mere 20% of the electron beam energy to pass (more hole and less metal than the shadow mask), the major problem here is heat.

Thus as the color CRT operates, the shadow mask (or aperture grille) absorbs the bulk of the electron beam energy, heats up, and physically distorts. This introduces convergence problems, and reduces viewed resolution.

So there you have it. The final viewed resolution of the displayed video is a result of both the system video bandwidth, and the quality of the mechanics of the color CRT and its convergence method.

Since the user can do very little about the CRT and its deflection/convergence system, all he can do is "play" with the bandwidth. However, this becomes difficult since bandwidth is designed into the system, and in most cases is reflected in the video monitor price. But, all is not lost.

Apparent Bandwidth. Although it is possible to use both hardware and software computer techniques to enhance a video image, there is another, less complex approach open for the electronics experimenter. The technique to be described is being passed along to any interested hardware types. I would be interested in hearing from any readers experimenting with this technique.

The approach shown will convert a low-bandwidth video monitor into an apparently much higher bandwidth version. In other words, you can now have the bandwidth you didn't buy. As an added extra, it also allows for a form of "three-dimensional" alphanumerics. However, this technique should be tried only by serious hardware people who have a schematic of their video monitor, and have had construction experience.

In essence, the approach to be discussed uses an "optical matrix" to produce the enhanced image. Don't let the term optical matrix throw you, it is merely the visible results (on the CRT screen), of what happens when you experiment with the various voltages that the electron gun needs to cause a pixel to either glow or remain dark.

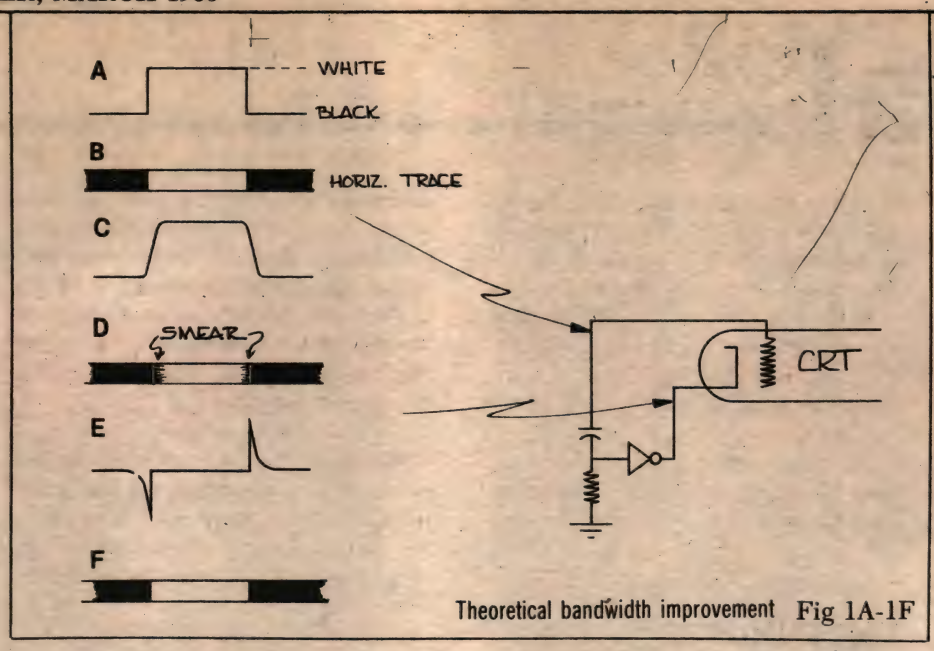
Since infinite bandwidth is not readily available in this world, the square-edged waveform shown in Figure 1A (which is a typical computer output signal) can exist only as an illustration in a magazine or book. Such a waveform would form a sharp dark-to-light transition of the electron beam such as shown in Figure 1B.

However, in the real world of limited bandwidth, after the square-edged wave passes through the video system it loses some of its high-frequency components (the amount is a function of the bandwidth of the system), and arrives at the CRT looking a trifle slope-shouldered as shown in Figure 1C.

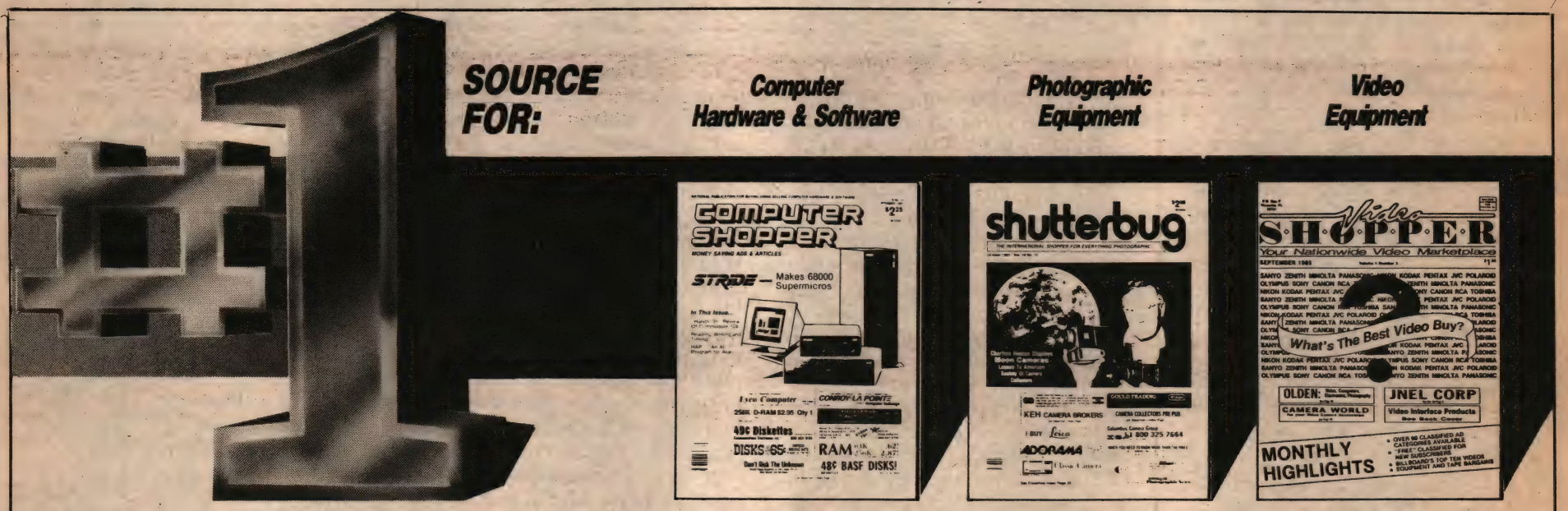
Before we go any further, it should be pointed out that if the control grid of a CRT is made positive with repsect to the cathode, the beam becomes brighter while the control grid is positive. The converse is also true — that is when the cathode of the CRT is made negative with respect to the control grid, the beam brightens.

Also, you can flip the whole thing over and say that if the control grid is made negative with respect to the cathode, or if the cathode is made

continued on page 15



Theoretical bandwidth improvement Fig 1A-1F



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Stan Veit's History
The First Personal Computer Shows

The first personal computer shows were held in March, 1976. The World Altair Computer Convention was held in Albuquerque, New Mexico on March 27 and March 28 at the Marina Hotel at the Albuquerque Airport. Organized by MITS, this show was supposed to be an exclusive convention of Altair users and the only exhibitor was to be MITS company itself. However things did not go according to President Ed Robert's plan and other vendors of Altair compatible equipment, such as Processor Technology, were able to rent rooms in the hotel in order to show their equipment.

Altair users and perspective Altair users from all over the world attended. Prizes were awarded for the best applications for an Altair and seminars were held with such speakers as, Carl Helmers, Editor of *Byte* magazine, Les Solomon of *Popular Electronics* and David Ahl of *Creative Computing Magazine*. The organizer of the show was David Bunnell now of *PC World* Magazine, who then worked for MITS.

I did not attend that show being too busy in New York with my Computer Mart, but I was also preparing for the first Trenton Computer Show organized by Sol Libes of The New Jersey Amateur Computer Group and Dr. Allen Katz of Trenton State College. The Trenton Show was really the first microcomputer show that was open to all hobbyists and manufacturers that had ever been held. The memory of that exciting first show remains with all who attended.

The college turned over their student center for the exhibits and class rooms for seminars. Outside in the large parking lot was the World's Biggest Computer Flea Market (and one of the first).

I had an exhibit booth inside and I had made a decision that I would be different. All the other computer dealers would be showing Altairs and Imsais, so I decided the smart thing to do would be to show a Sphere Computer. Now most of you have never heard of a Sphere because it is long gone from the scene. It was the first complete desk top computer with a built-in CRT and keyboard. Not only that, but it had a cassette interface and some Sphere models were even equipped with a disk drive! Sphere used a 6800 CPU and had 32K of RAM (an unheard of amount of memory). The Sphere was made in Bountiful, Utah and had been designed by a man named Mike Wise who was way ahead of his time. It also had some serious problems that were never solved and caused its downfall.

When they advertised the Sphere you saw a picture of a sleek desktop computer with a user typing away on the keyboard. What they never showed you was the power supply. This was a large metal box with a heavy transformer. It sat on the floor near the computer and it was connected to the computer by a cable of wires that carried the regulated DC needed to operate the machine. The long cable caused a voltage drop between the power supply and the computer circuits so that the computer operated marginally and all kinds of glitches occurred. For example, when I tried to load BASIC from a cassette tape, (a process that took at least 15 minutes), and my wife rang a sale on our cash register, the program would bomb! However, if you ever got the machine loaded with BASIC, it could run some neat programs.

When The Computer Mart of New York crew got to Trenton and set up our equipment we found that they had one long electrical cable and all the booths were connected to it. Down at the start of the cable was Digital Equipment Corporation with a big PDP-11 computer running an elaborate electric train set. This would heat up in the crowded hall so they only ran it every 15-minutes or so, turning it off when not in use. Down the hall were Altair and Imsai dealers with their S-100 computers which had a power supply producing unregulated power which was then regulated right on each plug-in board. Even these normally stable boards would tend to crash when the DEC monster was turned on. What it did to my marginal Sphere power supply was tragic. David Levine, my technician spent the whole day loading and reloading the Sphere BASIC until he was ready to cry into his beard.

To make things worse, technical problems were not the only problems I had in Trenton. The Sphere Co. had sold a lot of computer kits and only made partial shipments of parts. They owed every one of their customers some vital part necessary to complete the computer. All these people thought I was the Sphere Company and I caught all the flak directed at the manufacturer. It did no good to tell them that I was only a dealer and in the same position they were. I have never had so many people mad at me in my life. The only thing I could do was to flee from my booth and leave David to face the ire of the Sphere owners. He quickly developed a defense "Hey we are only dealers and you didn't buy your kit from us so don't complain to us!"

Being unable to return to my booth, I really enjoyed the show. Hal Chamberlain was conducting a seminar on computer music which was brand new to us all. I had only thought of a computer as a data processing machine up to that point and Hal's lecture opened my eyes.

Down the hall was an exhibit of a company from Fraser Pa. This group sold digital group computers built into attractive wooden cabinets that looked like a piece of furniture that you might have in your living room. They called their assembly a "Personal Computer" and that was the first use of that term ever. The name of the company was The Personal Computer Company and they, not Apple invented the personal computer. We all called our machines "Microcomputers," or even minicomputers.

I also met the founders of Ohio Scientific who had driven from Hiram, Ohio to show their new designs. Mike Cheiky was a man with unusual ideas about computer design and his company grew to be one of the largest in the industry. It was finally bought out by the huge MaCom Company who ran it into the ground and dissolved it, selling the name to a new company who is again producing Ohio Scientific Computers.

At that first Trenton Show I met many people who have been friends over the decade since it was held. The industry has changed but many people I met in Trenton continue to make news in the field.

The Trenton Show continues to be held at Trenton State College and it will be in April this year. It is still one of the largest computer flea markets in the country and worth attending if you can make it.

At the 1976 Trenton show, people from all over the country came and realized that microcomputers were here to stay and that many people wanted to find out more about them.

Two men who were inspired to start additional shows of their own were John Dilks, and Jim Warren. John Dilks got a group together to stage the first really large show in Atlantic City. Jim Warren started the wheels turning that resulted in the first Computer Faire in San Francisco. Both of these shows attracted exhibitors from all over the country and attendees from Europe and Japan. At the Atlantic City Show the Apple was first shown to the world. The first 16-bit Alpha Micro was shown as well as the first S-100 CPU with a Z80 chip. The SOL Computer was introduced and so was the first Cromemco computer. ●

Pixels and Bandwidths
continued from page 14

positive with respect to the control grid, the beam darkens.

Thus, the electron beam can be made to display bright or dark spots along a horizontal line (trace) depending on the polarity of the signals applied to the CRT control grid and cathode.

You must understand the previous three paragraphs before proceeding.

If the signal shown in Figure 1C is applied to the CRT control grid (assuming that the cathode is dc-supplied to create the brightness function), as shown in Figure 1D, the horizontal trace will display a dark front edge, followed by a "smear" (due to the lack of high frequencies in the waveform), the actual bright part, followed by a trailing-edge "smear." This signal smear is typical of limited-bandwidth systems.

Note that in Figure 1, the input video waveform is also coupled to a differentiator and inverter-amplifier. The resulting differentiated signal looks like that shown in Figure 1E and is applied to the cathode of the CRT (via a capacitor if the cathode controls the CRT brightness).

Now let us look at the sequence of events at the CRT.

In "real time," the first signal to arrive at the CRT is the Figure 1E negative-going spike at the cathode of the CRT. This signal immediately turns the electron beam on as shown in Figure 1F.

Before the voltage on the cathode drops enough to allow the CRT electron beam to turn off again, the positive-going video signal of Figure 1C arrives at the control grid, thus keeping the electron beam turned on. At this point, the signal on the CRT control grid has taken over.

Just as the trailing edge of the Figure 1C waveform is about to decrease and produce a trailing edge smear, the steep positive-going differentiated spike of Figure 1E snaps the cathode positive, thus sharply cutting off the CRT beam.

Thus, in essence, the viewed on-screen pixel (shown in Figure 1F) has sharp edges, and since it looks similar to that shown in Figure 1B which was produced by a "perfect" square edged wave, it has all the characteristics of a much higher bandwidth video system.

Interested experimenters can adjust the differentiator for various degrees of "overshoot" to produce a three-dimensional effect that will enhance alphanumeric displays.

Although the following are not related to video bandwidth, they may explain some strange things you may have seen in a perfectly good video image.

In a standard color-TV or video monitor, the chroma oscillator (3.58 MHz) is exactly 227.5 times the horizontal line scan frequency. This limits chroma on a given line to some 200 changes per line. Thus, a 512-pixel scan line cannot produce alternating red-green pixels.

To keep the displayed video image flicker free, an interlace system is used. In this case, it takes 1/30th of a second to create the odd lines of the display, followed by the even lines for 1/30th of a second. Thus in a computer display, if an application calls for a set of horizontal straight lines that happen to be spaced an even number of lines apart, the picture may flicker since 1/30th of a second is close to the visible flicker rate. Keep this in mind when creating computer images. ●

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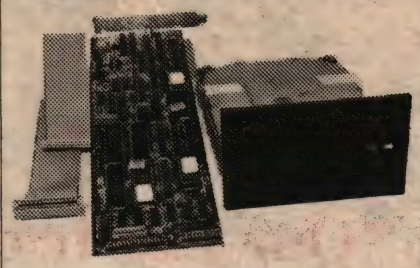
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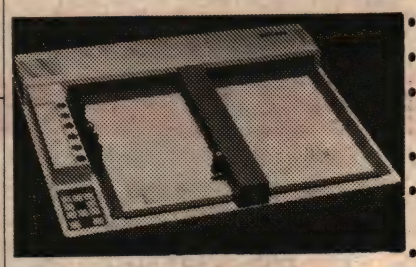
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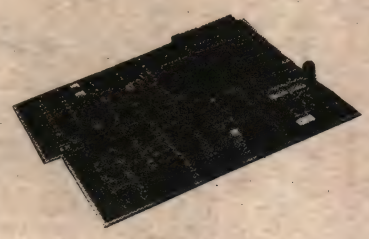
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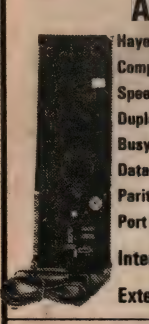
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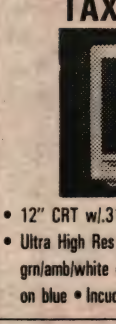
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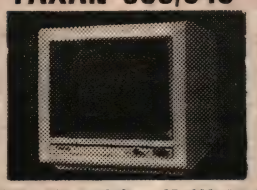
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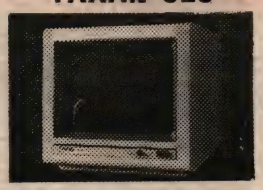
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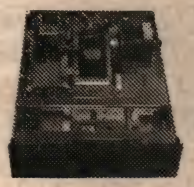
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640 12" Ultra Hi Res IBM/Multi-Switch 495
555 Board 630/640 185

ROLAND
MB122 12" Green IBM 125
MB123 12" Amber IBM 135
MB142 14" BGW IBM ..... CALL

IBM
Monochrome Monitor ..... CALL
Color Monitor ..... CALL
Enhance Color Monitor ..... CALL

MODEMS

HAYES
Startmodem 1200 Baud 369
Startmodem 1200B (INT) w/o Soft 335
Startmodem 1200B w/Soft 359
Startmodem 2400 Baud 539
Chronograph 185
Transet 1000 (1200 Add-On) 279

ANCHOR AUTOMATION
Volksmodem 12 189
Signalman Express 259
Signalman Lightning 24 2400 Baud 389

PROMETHEUS
Promodem 1200 289
Promodem 1200B w/o Soft 239
Promodem 1200A Apple ..... CALL

US ROBOTICS
Password 1200 Baud 229
Courier 2400 Baud 399

RACAL VADIC
1200 EXT/INT W/Soft 235
2400 EXT/INT W/Soft 419

TECMAR
Phonegate 2400 535

QUADRAM
Quadmodem II 1200 Half-card w/crosstalk 289
Quadmodem 2400 Hardcard w/crosstalk 465

NOVATION
2400 Baud w/Mite 499

AST
Reach 1200 Baud Ipt/1/2 CD w/crosstalk 349

VENTEL
PCM-1202 1200 Baud Fullcard Internal 335
PCm-XT 1200 1200 Baud Halfcard Internal w/crosstalk 355

PRIAM
ID-40 XT OR AT 42.7 Meg Int ..... CALL
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DX-20 20 CPS LQ 110 COL 329
DX-35 35 CPS LQ 132 COL 645
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SR-15 200 CPS 132 COL 609

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P1351, 192/100 CPS 132 COL ..... CALL
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P351 P/S 288/100 CPS 132 COL 1079
P341 P 216/72 CPS 80 COL 775
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HR-25 LQ 25 CPS 132 COL 479
HR-35 LQ 35 CPS 132 COL 705
Twinwriter 5 36CPS LQ/140 CPS Dm 875
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P565 P/S Dual 240/100 CPS 136 COL 1095

SILVER REED
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EXP500 LQ 14 CPS 80 COL 269
EXP550 LQ 18 CPS 132 COL 375
EXP800 LQ 40 CPS 132 COL 675

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DBase III ..... CALL
RBase 5000 389
PFS:File 85
Power Base 259
Cornerstone 289
Knowledgeman 285

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Wordstar 2000 259
Wordstar 2000 289
PFS: Write 82
Multimate 235
Microsoft Word 255
SSI Word Perfect 235
Samna Word III 269

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Crosstalk XVI 115
Smartcom II 99
Remote 109
Microsoft Access 159

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Your Personal Net Worth 69
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Print Shop 39
Sublogic Jet 36
Microsoft Flight Simulator 35
Micropose F-15 Strike Eagle 25
Micropose Solo Flight 25
Hayden Sargon III 35
Broderbund Ancient Art of War 34
Activision Ghostbusters 29
Infocom Hitchhikers Guide to Galaxy 29
Spectrum Holobyte Gato 29
APBA Major League Baseball 59

UTILITIES
Sideways 39
Sidekick or Toolbox 35
Super Key or Turbo Pascal 45
Turbo Lightening 65
Turbo Editor Toolbox 49
Reflex 65
Turbo Pascal w/8087 69
Turbo Gameworks 39
Turbo Holiday Pack 79
Bourbaki "1 Dir 65
Norton Utilities 3.0 59
PFS: Report 75
PFS: Proof 59
Recalc + ... 59
Quickcode III 169
DGraph III 169
Dutil III 65
Prokey 79
Microsoft Macro Assembler 99
Fortran Compiler 219
Basic Compiler 245
Cobol Compiler 415
Pascal Compiler 185

BUSINESS
CPA + ... 369
Harvard Project Manager 229
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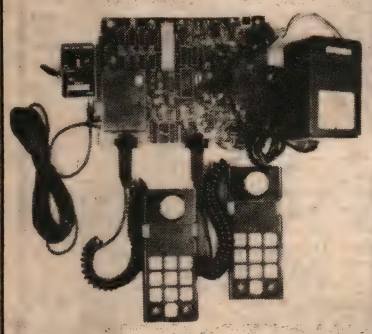
ADAM COMPUTER KIT!
(Less printer & w/o cabinet)



Build it yourself from subassemblies. No wiring necessary (just plugs together). Hook-up diagram included. Includes: Keyboard, 2 cassette digital data drives, 2 game controllers, power supply, all memory boards, and one cassette. Is capable of running CP/M, has built-in word processor.

Item #7410 **$99.00** (complete)

COLECO VISION KIT
(Assemble yourself, diagram incl.)



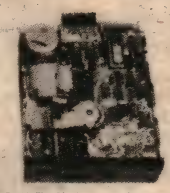
Complete unit, without housing. Can be easily mounted on any base. Contains: game board, 2 controllers, power supply, TV game switch & connecting coaxial cable.

Item #7411 **$19.95**

5¼" DISK DRIVES



½ HT
96 TPI
DS/Quad
Tandon #TM55-4
Item #1904 **$79.50** ea.
or 2 for **$150.00**



FULL HT
96 TPI
DS/Quad
Tandon #TM101-4
Item #1901 **$99.00** ea.

COMPUTER TAPE DRIVE
(For Adam)



Serial format. Search 80IPS — Read/ Write 20IPS. 12V motor, 5V logic, 8 & 9 pin connector cables. Originally designed for the Adam.
Dim: 5"W x 3¾"H x 4" deep
Item #6641 **$9.95** New

♥ of the 'ADAM'



Logic board for the Adam computer. Includes the following components: 8 ea. 4164-4s, 74LS157, 74LS541, LS273N; 2 ea. LM339s, plus microprocessors with ROMs.
Mfr — Coleco
Item #7231 **$9.95** RFE

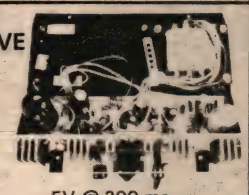
PRINTER MECHANISM



Originally designed for the Gavalin computer.
- Centronics interface
- 80 column width
- Friction drive (schematic incl.)

Item #5223 **$19.95** New

LINEAR DISK DRIVE POWER SUPPLY



DC Output: –5V @ 200 ma.
+5V @ 3 amps
+12V @ 2.9 amps
+18V (inductive) @ 1 amp
Input: 115V/60 Hz.
Chassis Dim: 11"W x 4"H x 8"D
Item #6642 **$14.95** New

PLUG-IN POWER SUPPLY



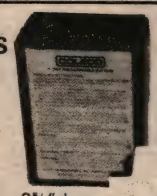
OUTPUT: +5 VDC, .9A
–5 VDC, .1A
+12 VDC, .3A
INPUT: 120 VAC/60 Hz., .25A
Mfr — Coleco #55416
Item #1882 **$4.95** New

COMPUTER SWITCHING POWER SUPPLY



Input: 115/230VAC, 50/60Hz
Output: 12VDC @ .17 amps
+24VDC @ 2.2 amps
+5VDC @ 3 amps
Dim.: 7⅜" × 6½"
Mfr — Astec #AA11101
Item #5353 **$19.95** New

GEL-CELL BATTERY PACKS



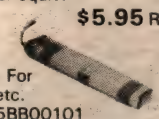
Rechargeable —
For use with model cars, trains, boats, planes, etc. . . .
6V @ 9.5AH
Dim.: 5½"H x 4⅛"W x 2⅝"deep
Mfr — Elpower #695
Item #7039 **$14.95** New

12V @ 1.9AH
Dim.: 7"L x 2¼"H x 1⅜"D
Mfr — Power-sonic #PS1219
Item #7021 **$9.95** New

Rechargeable NICAD BATTERY BACKUPS



12V @ 450 ma
Contains 10 AA cells.
Recharge rate: 45 ma. 16–18 hours.
Case with tab out put connections.
Dim.: 2 1/16"H x 1¼"W x 2 15/16"L
Mfr — GE 123233 or equiv.
Item #5443 **$5.95** RFE



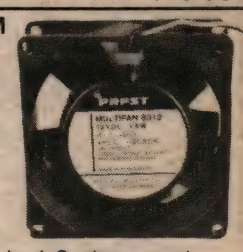
13.2V @ 1.65 AH
Contains 11 C cells. For model boats, toys, etc.
Mfr — GE #41B035BB00101
Item #5444 **$15.95** New

115 CFM MUFFIN FAN



115 VAC/60 Hz., 21W., 28A., 3100 RPM; 5-blade model, aluminum housing. Can be mounted for blowing or exhaust.
Dim.: 4 11/16" sq. × 1½" deep.
Item #5345 **$7.95** RFE

30 CFM MINI FAN
12 VDC



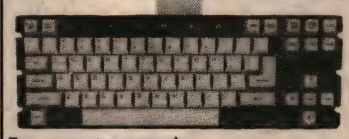
Low noise level. Can be mounted for cooling or exhaust.
Dim.: 3⅛" sq. x 1½" deep
12VDC — Papst #8312
Item #7017 **$12.95** New

MAGNETIC RECORDING TAPE



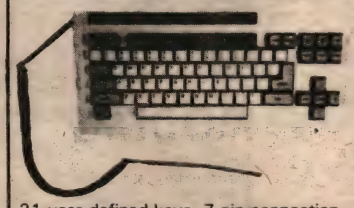
Pre-recorded, bulk erased, by major manufacturers such as Ampex, 3M or Scotch. 7½" reels, 1500 ft. 1 mil.
Item #6710 26 reels **$9.95**

75-KEY MECHANICAL KEYBOARD — For Adam



For computer upgrade . . .
21 user-defined keys, SPST mechanical switches, 21-pin ribbon cable connection. General instructions for replacement of membrane keyboards incl. Update computers such as the Timex Sinclair Z81/1000
Dim.: 13½"W x 1¾"H x 5"D.
Item #7429 **$5.95** New

ASCII 75-KEY KEYBOARD For Adam —



21 user-defined keys. 7-pin connection. ASCII 8-bit serial output. Originally designed for the Adam.
Dim.: 15"W x 2½"H x 6½" D
Item #6643 **$19.95** New

ADC KITS

ROBOTICS KIT
(Springs, Belts, Pulleys & Gears)

Consists of:
9 Timing Belts (7.5" to 13")
2 Roung Belts (12" to 15")
15 Nylon & Plastic Spur & Drive Gears
22 Torsion Springs
6 Compression Pulleys
19 Tension Springs
Item #5306 **$14.95** New

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For Robotics —
Consists of: 18 asst. toy motors, from 1.5V to 12VDC.
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Hundreds of components!
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STEPPING MOTORS — for ROBOTICS

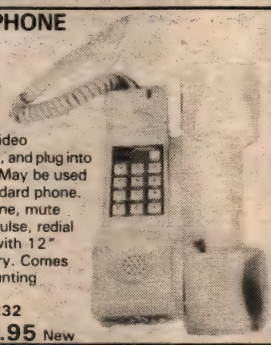
Precision steppers with increments from 1 to 7.5 degrees. Speeds up to 5,000 steps.

#5269 #5275 #5272 #5431

Item No.	Step Angle	DC Volts	Stall Torque oz/in	Dimensions H x W x D (in.) 1) Body 2) Shaft	Mfr. & Part No.	Price
5431	1	5	17*	1) 1⅞ x 1¾ x 1	N.A. Phillips	
				2) 1⅛ x ½	A82310-M2	2/ $ 9.95
5272	1.8	1.3	200	1) 4¼ dia x 4½	Sigma 4742TD-	
				2) ⅜ dia. x 1 3/16	200F1.3	2/ 59.50
5269	7.5	9	36	1) 1¾ L x 2¾ dia	N.A. Phillips	
				2) ¼ dia. x ½ L	B82916	2/ 17.95
5275	1.8	1.8	72	1) 2 3/16 L x 2 3/16 dia	Superior Elec.	
				2) ¼ dia. x ¾ L	MO61-FF-6201B	2/ 37.50

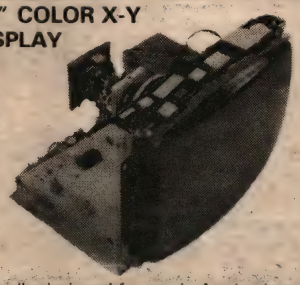
* Calculated

TELEPHONE



Originally designed to mount on TeleVideo computer, and plug into modem. May be used as a standard phone. Touch-tone, mute button, pulse, redial button, with 12" cord; Ivory. Comes with mounting bracket.
Item #7232
$9.95 New

19" COLOR X-Y DISPLAY



Originally designed for use in Atari coin-operated games. Contains 3-gun color tube, focus and brightness controls. Requires external X-Y inputs, 250-0-24V transformer for power. May be used for oscilloscopes, reprogrammed for game use, or modified with the use of external vertical and horizontal oscillators to a rastor scan display or TV monitor for computer use. (IBM compatible.) Transformer supplied.

Item #5449 **$99.00** New

12" COMPOSITE VIDEO MONITOR



Green phosphor; 40/80 column, 1000-line resolution. 18MHz bandwidth. Compatible with IBM, Apple, Commodore, and more. Includes external transformer for operation on 115 VAC & video cable.
Mfr – Elston Elec. #DM30
Item #6602 **$29.95** New

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WOW!WOW!WOW!

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Quad Board	172
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Hercules Monochrome	277
Color Card	109
Mono Graphics Card	119
Multifunction Card	109
Paradise Graphics	248
Paradise 5 Pack	109
STB Graphics + 2	202
STB R10 + 2	172
STB Mono Board	146
Tecmar Graphics	411
Tecmar Captian	148
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80287 Chip	151
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Everex Graphics Pacer	259
Everex Graphics Edge	219
Everex Edge	233

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800 nXL	59
1027 Printer	104
1050 Drive	129
Indus. Drive	189

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Hayes 1200	349
Hayes 1200B w/Smartcom	323
Hayes 300	120
Hayes 2400	556
Hayes 2400B	489
Micromodern 2E	123
Promethous 1200	284

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Amdek 300 Green	104
Amdek 300 Amber	109
310 Amber	129
Color 300	148
Color 500	222
Color 600	364
Color 710	390
Color 722	452
Princton HX12	390
Pincton HX12E	459
Princton Max 12E	142
SR12	533
Taxan 420	354

APPLE

2E	679

COMMODORE

Commodore 64	144
1541 Disk Drive	172
1802 Monitor	177
1902 Monitor	294
MPS 803	104
Indus. Drive	195
Commodore 128	239
Monitor	244
1571 Drive	214

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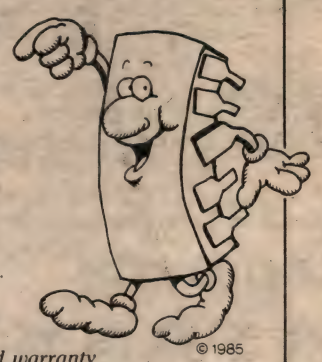
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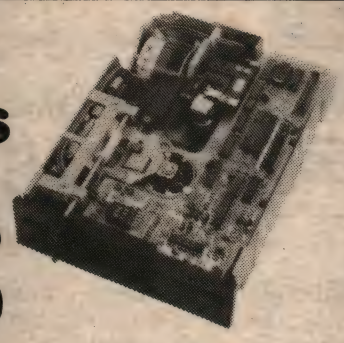
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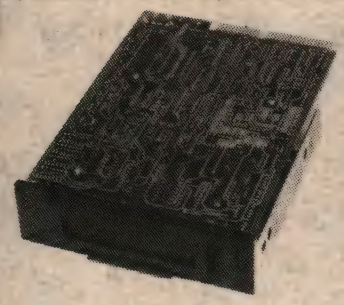
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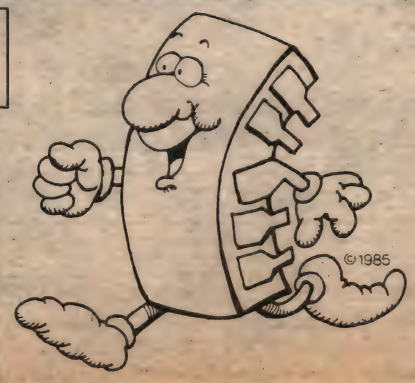
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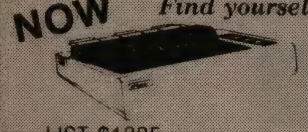
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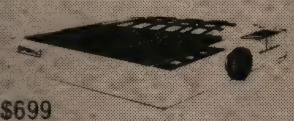
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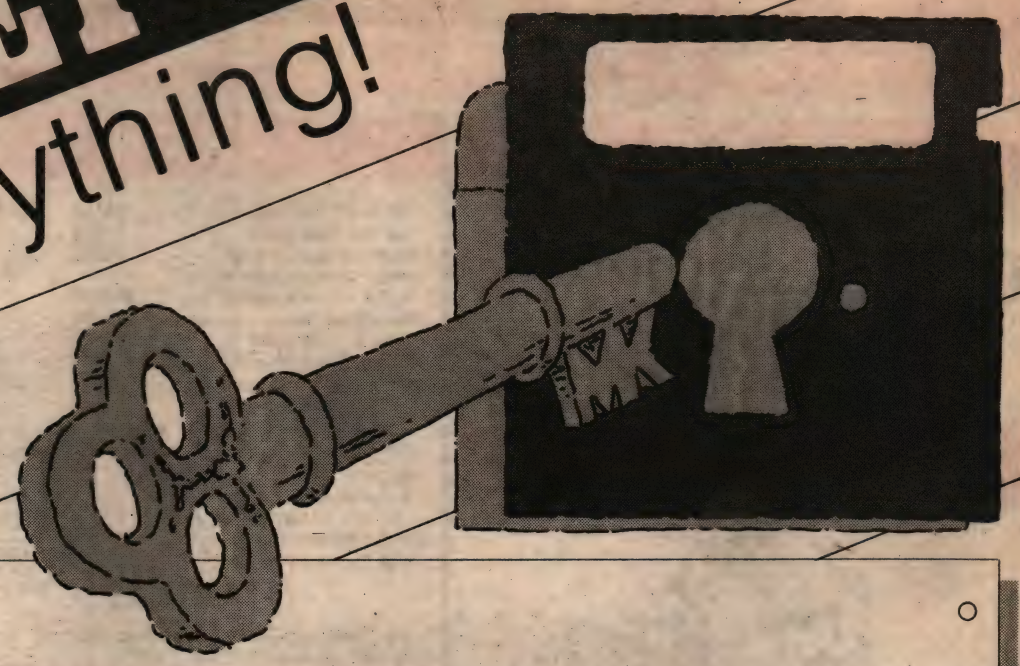
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```
A>DEBUG
-N PROGRAM.COM
-L
-D 100 129
33CB:0100  EB 0B 40 05 56 65 72 73-20 31 2E 38 31 50 B4 30   k.@.Vers 1.81P40
33CB:0110  CD 21 86 E0 3D 36 01 72-05 3D 0A 02 76 09 BA CB   M!.`=6.r.=..v.:K
33CB:0120  03 B4 09 CD 21 CD 20 58-EB 2F                     .4.M!M Xk/
```

Without MASTER*KEY, how long do you think it would take to find out this program wasn't running because you had the wrong version of DOS?

turn this:

into this

instantly and automatically with a turn of **MASTER*KEY**!

```
OFST  ASCII  OBJCODE     SRCECODE
                         ;Program:  PROGRAM.COM
0100          EB0B       H0100:  JMP     H010D
                         ;-----------------------------------------------
0102          40                 INC     AX              ;NON-BRANCHED CODE
0103   Ve     055665             ADD     AX,6556h
0106   rs     7273               JB      H017B  ;. . . . . .
0108    1     2031               AND     [BX+DI],DH
010A    .     2E                 DB      2Eh
010B   81     3831               CMP     [BX+DI],DH
                         ;-----------------------------------------------
010D   P      50         H010D:  PUSH    AX
010E    0     B430               MOV     AH,30h
0110    !     CD21               INT     21h             ;get DOS Version#
0112          86E0               XCHG    AL,AH
0114   =6     3D3601             CMP     AX,0136h
0117   r      7205               JB      H011E  ;. . . . . .
0119   =      3D0A02             CMP     AX,020Ah
011C   v      7609               JBE     H0127  ;. . . . . .
011E          BACB03     H011E:  MOV     DX,03CBh
0121          B409               MOV     AH,09h
0123    !     CD21               INT     21h             ;display string, DX
0125          CD20               INT     20h             ;terminate normally
                         ;-----------------------------------------------
0127   X      58         H0127:  POP     AX
0128    /     EB2F               JMP     H0159
                         ;-----------------------------------------------
```

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MASTER*KEY includes a Source Code Formatter and Cross-Reference Generator. The Formatter produces a documented source listing identifying all ROM BIOS and DOS Functions and Interrupts. It serves as an object code optimizer by helping to identify stack areas, temporary storage, ASCII strings, and unnecessary code. The Cross-Reference identifies the number and location of all labels, symbols, functions, and interrupts.

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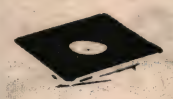
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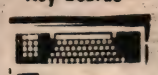
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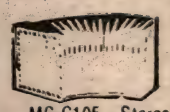
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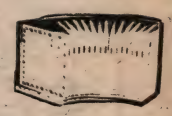
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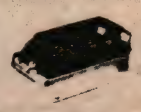
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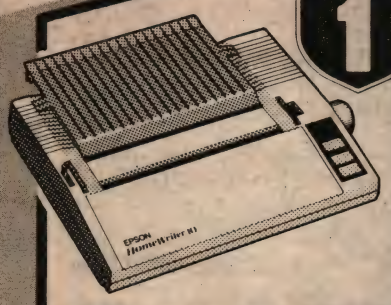
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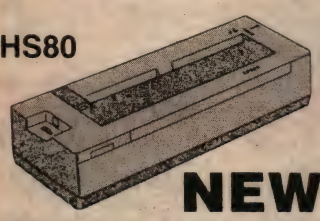
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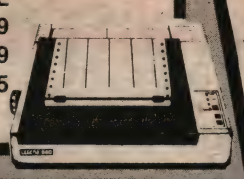
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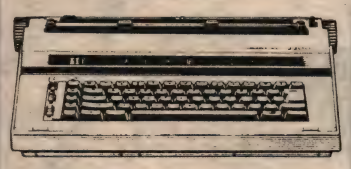
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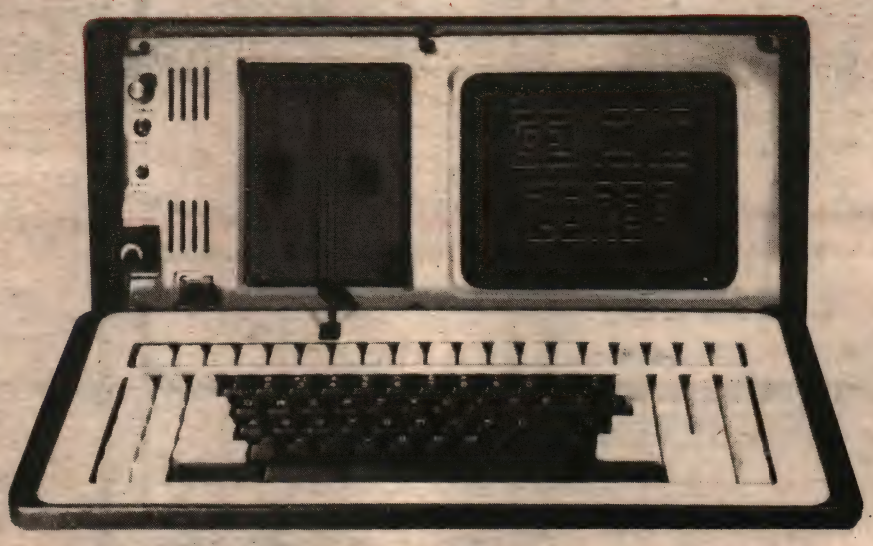
Everyone has heard it already, BIG BLUE is still there; just cheaper! Due to the competitiveness of the current computer industry and Japanese influence, GEMINI has found it necessary to rethink its buying and marketing strategies. Now with new purchasing agreements in hand and added buying power GEMINI is proud to announce the ZORBA at a New Lower than Low Price. The heat is on for MS DOS! CP/M is still alive, and now more affordable!

THE PUBLICS LEARNING WHY THE ZORBA IS STILL AND ALWAYS HAS BEEN THE EXPERTS CHOICE.

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PORTABLE COMPUTER

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- 19 INDEPENDENT, 55 PROGRAMABLE FUNCTION KEYS
- TWO 400K DSDD DRIVES
- 64K BYTES 150 NS RAM
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General Specifications

ZORBA is the lowest cost full featured portable computer. This light weight computer is ruggedly packaged in a convenient carrying case. The case surrounds a strong inner chassis which further protects the Z80A based computer with its two double sided double density disk 400K drives, large easy to read 9" display screen and well designed detachable keyboard.

ZORBA uses CP/M, the industry standard operating system, which means that a wide range of existing software is readily available to the user.

The ZORBA users manual covers operation of the unit, all supplied software and all interface and internal information. A system diskette is supplied with all system files and utilities. A second diskette contains the sources for all ZORBA software including BIOS, SETUP, FORMAT, and PATCH.

Keyboard

Keyboard communicates serially with CPU
Detachable with 2 foot coiled cord
95 keys in standard QWERTY format
13 Key Numeric pad
Independent Caps Lock and Shift Lock
55 Software programmable function keys
All keys auto-repeat after 1 second delay
All Standard cursor and terminal control keys

Disk System

Controller:	WD1793
Drives:	5.25 Double Sided, Double Density, 400K 48 TPI

Built-in disk interchange formats: Xerox 820 (SD, DD), Kaycomp (DD), DEC VT-180 (SD), Osborne (SD) and IBM-PC (eg. CPM/86) and Televideo 802 (Read/Write and Format compatibility) (Expandable to 82 Formats)

Specifications
General Mechanical and Electrical

Width	-17.5 inches (44.45 cm)
Height	- 9.0 inches (22.86 cm)
Depth	-16.0 inches (40.64 cm)
Weight	-24.6 pounds (11.1 Kg)
Power	-80-130 VAC or 190-245 VAC 50/60 Hz 170 watts max

Display

Display Tube:
9" diagonal, Green or Amber
High resolution display circuitry
60 Hz refresh rate

Display Format:
25 lines x 80 columns
5x7 Character Font with full descenders
128 ASCII Characters
8x9 32 Characters Graphic Font
2K Memory Mapped Display Buffer

CPU Board

Z80A CPU running at 4 Mhz with no wait states
64K bytes of 150 ns RAM (58K after CP/M loaded)
16K bytes of EPROM (2732) can be switched in and out by software 12K available for user EPROMS
8275 CRT controller, DMA driven
1793 Floppy disk controller, SMC data separator
Bipolar proms configure 10 addresses
Fully structured interrupts prioritized by bipolar proms

Interfaces

- Full asynchronous RS232 port with modem control. Baud rates and data translation and protocol programmable
- Full asynchronous full duplex RS232 port with hardware handshake (for printers). Baud rates and protocol programmable. (Serial Printer Port)
- One 8 Bit parallel port with independent strobe and ready lines. Supports Centronics interface with an available adaptor cable.
- IEEE 488 Bus Master Port (ie: General Purpose Instrumentation Bus) not Software Supported.
- 21 Standard Software Programmable Baud Rates: 45.5 to 19,200 BPS

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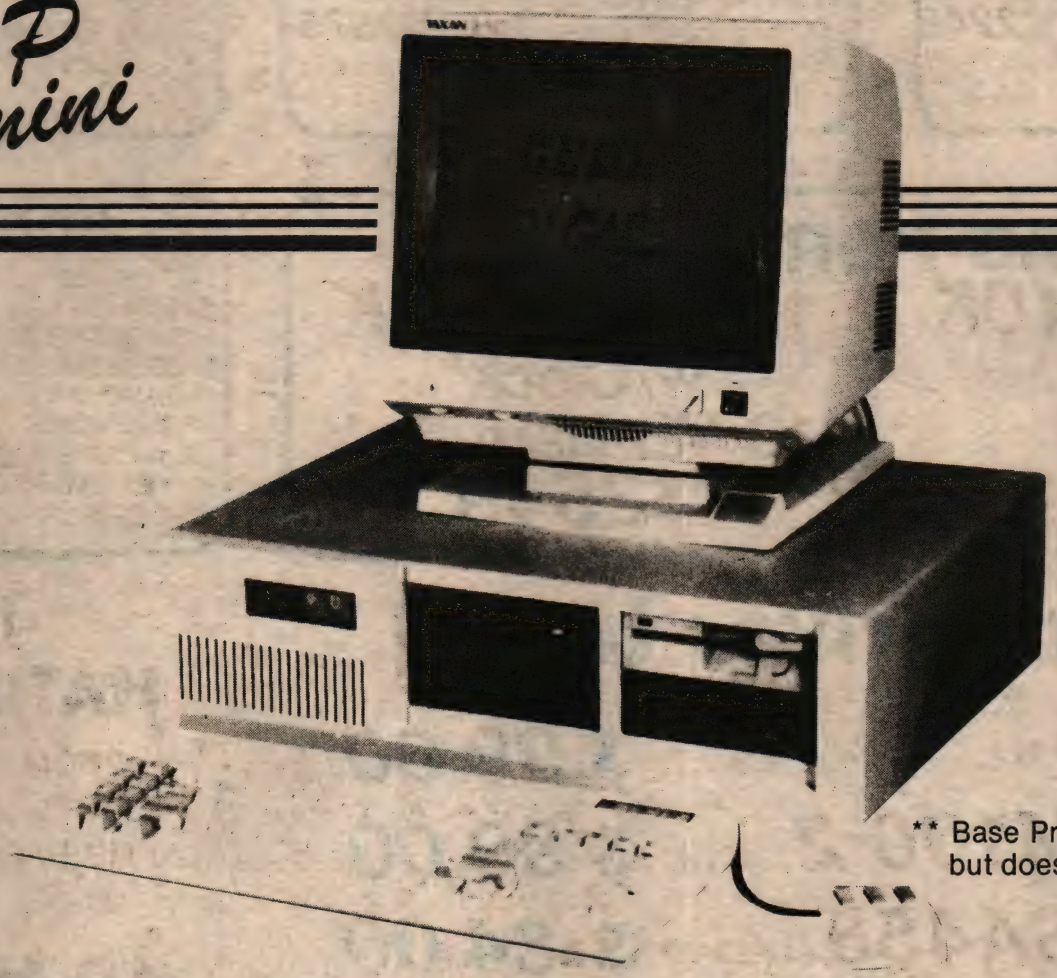
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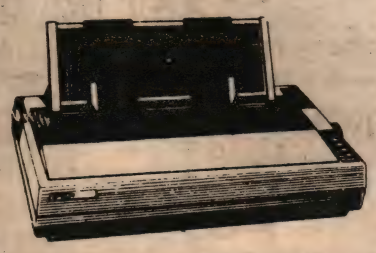
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5¼" Same as above, but bulk pack w/o envelope	6497-FA	0.49
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SSSD = Single Sided Single Density; SSDD = Single Sided Double Density; DSDD = Double Sided Double Density; DSQD = Double Sided Quad Density; DSHD = Double Sided High Density; TPI = Tracks per inch.

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Introducing Super Star Diskettes: the high quality diskette with the lowest price and the best LIFETIME WARRANTY!

In the course of selling more than a million diskettes every month, we've learned something: higher prices don't necessarily mean higher quality.

In fact, we've found that a good diskette manufacturer simply manufactures a good diskette...no matter what they charge for it. (By way of example, consider that none of the brands that we carry has a return rate of greater than 1/1,000th of 1 percent!)

In other words, when people buy a more expensive diskette, they aren't necessarily buying higher quality.

The extra money might be going toward flashier advertising, snazzier packaging or simply higher profits.

But the extra money in a higher price isn't buying better quality.

All of the good manufacturers put out a good diskette. Period.

How to cut diskette prices ...without cutting quality.

Now this discovery posed a dilemma: how to cut the price of diskettes without lowering the quality.

There are about 85 companies claiming to be "diskette" manufacturers.

Trouble is, most of them aren't manufacturers.

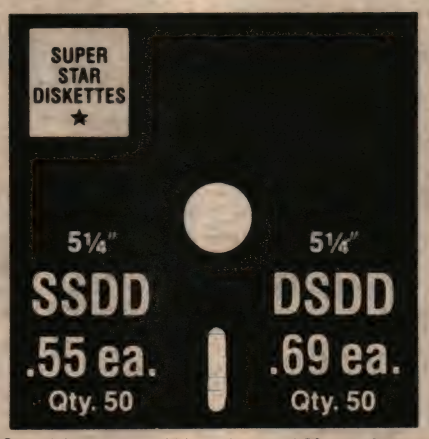
Rather they are fabricators or marketers, taking other company's components, possibly doing one or more steps of the processing themselves and pasting their labels on the finished product.

The new IBM diskettes, for example, are one of these. So are IBM 5¼" diskettes. Same for DYSAN, Polaroid and many, many other familiar diskette brand names. Each of these diskettes is manufactured in whole or in part by another company!

So, we decided to act just like the big guys. That's how we would cut diskette prices...without lowering the quality.

We would go out and find smaller companies to manufacture a diskette to our specifications...specifications which are higher than most...and simply create our own "name brand" diskette.

Name brand diskettes that offered high quality at low prices.



Super Star diskettes are sold in multiples of 50 only. Diskettes are shipped with white Polymer-impregnated cardboard sleeves, reinforced hubs, user ID labels and write-protect tabs.

Boy, did we get lucky. Our Super Star Diskettes are the same ones you've been using for years...without knowing it.

In our search for the low priced, high quality diskette of our dreams, we found something even more interesting.

We found that there are several manufacturers who don't give a hoot about the consumer market for their diskettes. They don't spend millions of dollars in advertising trying to get you, the computer user, to use their diskettes.

Instead, they concentrate their efforts on turning out the highest quality diskettes they can...because they sell them to the software publishers, computer manufacturers and other folks who (in turn) put their name on them...and sell them for much higher prices to you!

After all, when a software publisher or computer manufacturer or diskette marketer puts their name on a diskette, they want it to work time after time, everytime. (Especially software publishers who have the nasty habit of copy-protecting their originals!)

Super Star Diskettes. You already know how good they are. Now you can buy them...cheap.

Well, that's the story.

Super Star diskettes don't roll off the boat from Pago-Pago or emerge from a basement plant just east of Nowhere.

Super Star diskettes have been around for years...and you've used them for years as copy-protected software originals, unprotected originals. Sometimes, depending on which computer you own, the system master may have been on a Super Star diskette. And maybe more than once, you've bought a box or two or more of Super Star diskettes without knowing it. They just had some "big" company's name on them.

Super Star Diskettes are good. So good that a lot of major software publishers, computer manufacturers and other diskette marketers buy them in the tens or hundreds of thousands.

We buy them in the millions.

And than we sell them to you.

Cheap.

When every little bit counts, it's Super Star Diskettes.

You've used them a hundred times...under different names.

Now, you can buy the real McCoy, the same diskette that major software publishers, computer manufacturers and diskette marketers buy...and call their own.

We simply charge less.

Super Special!

Store 75 diskettes for only $5.95!



Yep, that's right: order 50 Super Star diskettes, add $5.95 and we'll include a Media Products DISK MINDER II...a well made unit that we're impressed with.

It holds 75 diskettes securely and looks nice too!

FRAUD ALERT!

Please be careful!

A lot of the "no-name" diskettes flooding the market at prices of less than $1.00 are what we in the industry call "floor sweepings."

In other words, they're garbage...stuff that six months ago, no self-respecting manufacturer would have sold.

But times got tough and some people's scruples got a little lost in desperation...and so a lot of computer users are getting some really bad disks...and that isn't bargain at all.

So, when the price seems too good to be true...like 39 cents, be careful...very careful!

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The Super Star LIFETIME WARRANTY!

Super Star Diskettes are unconditionally warranted against defects in original material and workmanship so long as owned by the original purchaser. Returns are simple: just send the defective diskettes with proof of purchase, postage-paid by you with a short explanation of the problem, and we'll send you the replacements. (Incidentally, coffee stained diskettes and diskettes with staples driven through them don't qualify as "defective".)

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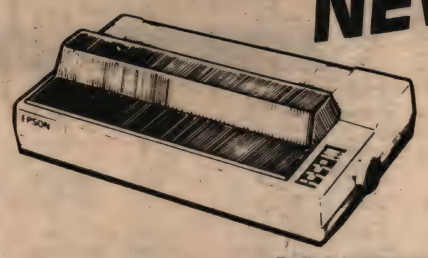
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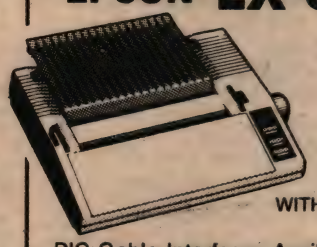
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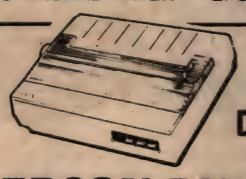
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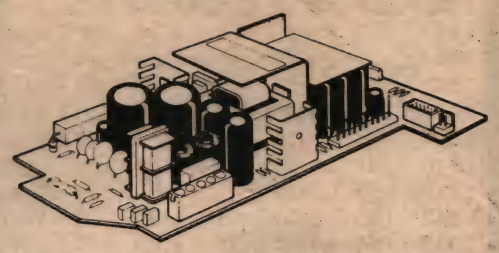
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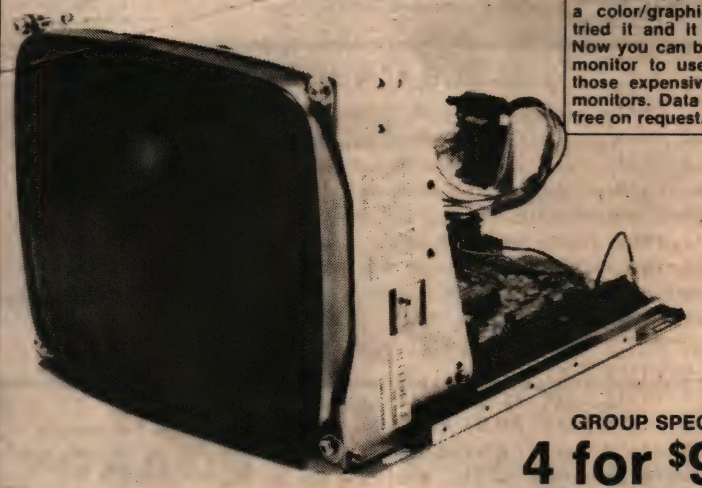
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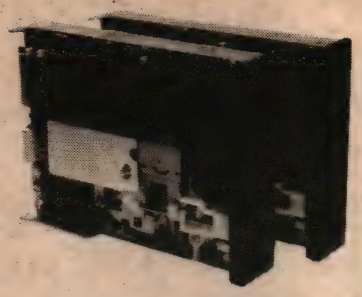
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Apparently manufactured for Atari by Raycal-Vadic. P.C Board #81219-903 Rev. D. These are complete factory finished modem boards with all parts except the 8048 (8748) C.P.U. chip, for which there is a socket. Includes the popular T.I. TMS99532 modem chip which is socketed. This T.I. chip alone lists for as much as $29.95 at some of our competitiors. These are factory new boards with all connectors, switches, relay, etc., but are sold as is —no warranty or data. Super limited quantity.

DIRECT CONNECT

$7.95 3/$20.00

Add $1.50 each for shipping

VERY LIMITED QTY. 8048 For Above Board $7.50

400/800 CASETTES

REQUIRES ATARI RECORDER

We bought 5 skids of these casettes. Titles include: *Touch Typing, Invitation to Programming I & II, Hangman, Introduction to Sound, Blackjack, Juggles House, Juggles Rainbow, Introduction to Graphics, States and Capitals, European Countries and Capitals, Scram and Writing Programs Two.* These are a very high quality recording tape and may be recorded over for excellent reproduction. Most come in casette holders. Sorry, no choice on titles. Super good assortment (some duplications when necessary). Most C-60. May be last chance to obtain these.

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"TALKERS"

SPEECH SYNTHESIS TECHNOLOGY AT SURPLUS PRICES!

We were recently fortunate to purchase a small lot of surplus computer boards that incorporate the very latest in high quality human speech synthesis.

This two board set was the heart of a blood analysis system designed for use by blind diabetics. This unique device was conceived by one of the world's leaders in computer blood systems. Apparently no expense was spared in either the research, design, or fabrication of this computer.

The board sets we are offering are NOT complete blood analysis systems and are sold only for the speech synthesis circuitry they contain. A powerful motorola 68705 U3L single chip processor controlled the blood analysis unit. This processor also interfaces to the General Instruments two chip speech set which includes a SPO256-AL2 (28 pins) and a SPROOO (40 pins).

The GI SPO256 contains 59 addressable allophones and 5 pauses which may be strung together to produce any English word. The SPROOO allows expansion to the external EPROM (27128) for storage of the desired vocabulary. The SPO256 also has a vocal tract model, 16K ROM, ALU, handshake control, pulse width modulator, 12 holding registers, and 5 interpolation registers all in one 28 pin package! This high density chip design allows for a complete voice system that requires only a few parts to be complete.

By adding only one resistor, the units can be put into a "Test" mode to demonstrate the internal vocabulary. This board set has been selling like crazy at surplus stores in both Dallas and Houston. We have, however, set aside a limited number of these boards for sale to our special mail order customers. One resourceful customer in Houston even had one of these "Talkers" connected to his personal computer doing random speech!

These devices were powered by a regulated 9VDC 1 Amp power supply. We have luckily acquired a FEW of the supplies, and are selling them for $6.95 each when purchased WITH the Talkers. The DC supply is a totally self contained affair that is rated for only 10 mv ripple at the output. DC supply when purchased separately is $12.95.

We are also offering the GI set separately (new, unused parts) for $9.95. Remember: this is for BOTH chips. Radio Shack sells the SPO256 alone for $12.95!! Our stock on the new chip pairs is limited, please order early to avoid being left out. Sure, the completed Talker units are a better deal, but you still might want to purchase an extra chip set for a spare.

For the real hardware hackers we have a few of the blank PC board sets to the Talkers for $4 (both boards).

We include full schematics of the Talkers, GI speech chip set data, and "Test" instructions, with every shipment. Note: issue #29 of Analog Computing (P.O. Box 615 Holmes, PA 19043) has a very detailed article on using the SPO256 with a personal computer.

Due to the limited number of Talkers in stock, we advise early ordering.

$14.95

Add $3 Shipping in USA, Canada: add $6 (For Talker and supply)

Radio Shack tm of Tandy Corp.

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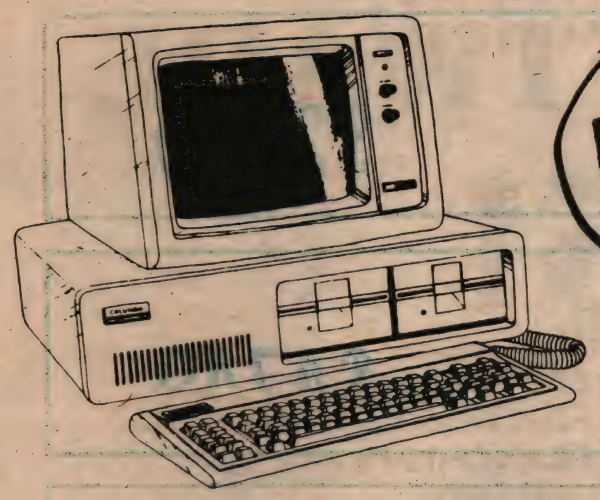
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SOFTWARE:

Lots of other machines can match the hardware features (without matching the price), but the main reason you want the Columbia is for the software. We have been compiling a list of all the software that won't run on it. We need your help with the list because WE HAVEN'T FOUND ANYTHING THAT WON'T RUN YET!! Some Sanyo dealers are advertising 90% compatibility, so are other dealers of other machines, including the Tandy 1000, but the first time you try protected game software on these you will be disappointed. It may be some time before you get to try 'bought' software with the Columbia though, because it comes with a huge bundle of software of 16 FREE programs WORTH over $3000.

These programs include: • MS-DOS 2.11 • MS-DOS tutorial • BasicA 2.0 (This runs all the IBM GW BASIC programs we tried) • Perfect Writer • Perfect Writer tutorial • Perfect Speller (50,000 words) • Perfect Calc spreadsheet • Perfect Calc tutorial • Perfect Filer DBMS • Fast Graphs (color) • Perfect Link (modem program) • Home Accountant Plus • Columbia MPC tutorial • Space Commanders • Hardware diagnostics •

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SOFTWARE:

Lots of other machines can match the hardware features (without matching the price), but the main reason you want this bargain is for the software. We have been compiling a list of all the software that won't run on it. We need your help with the list because WE HAVEN'T FOUND ANYTHING THAT WON'T RUN YET!! Some Sanyo dealers are advertising 90% compatibility, so are the other dealers of other machines including the Tandy 1000, but the first time you try protected game software on these you will be disappointed. It may be some time before you get to try 'bought' software with this bargain though, because it comes with a HUGE bundle of software of FREE progress WORTH over $3000.

These programs include: • MS-DOS 2.11 • BasicA 2.0 (This runs all the IBM GW BASIC programs we tried). • Word Processor • Speller (50,000 words) • Calc spreadsheet • Data Base DBMS • Communications Modem Program • **Lotus lookalike!!** • **COMPLETE ACCOUNTING PACKAGE INCLUDING:** • GEN LEDGER • ACCOUNTS RECEIVABLE • ACCOUNTS PAYABLE • INVENTORY • BILLING • FORECASTING • PURCHASE ORDER • Hardware diagnostics •

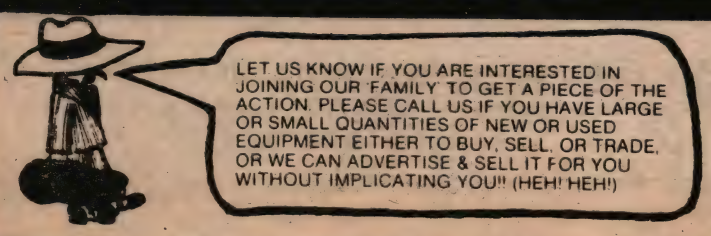
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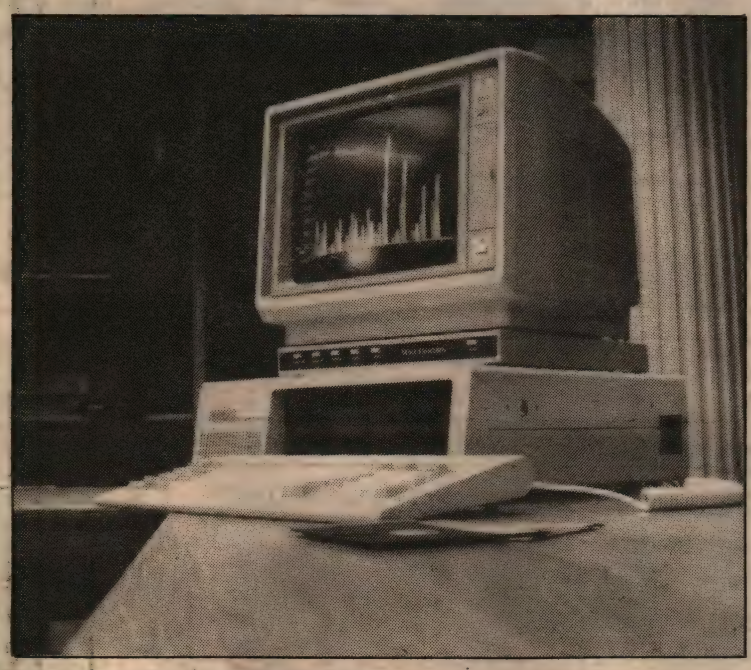
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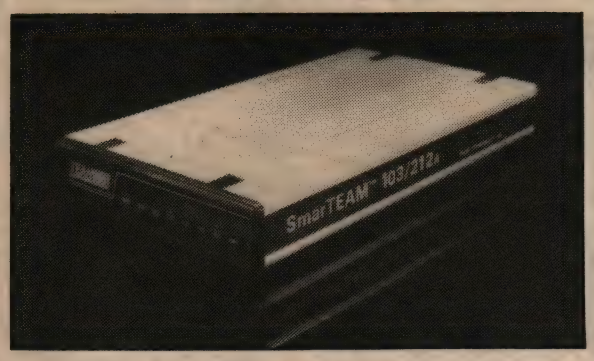
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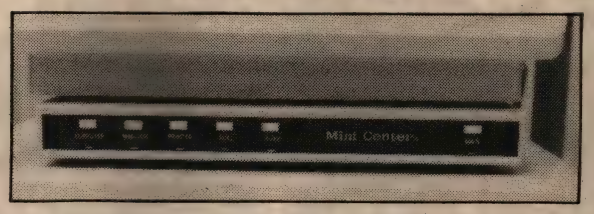
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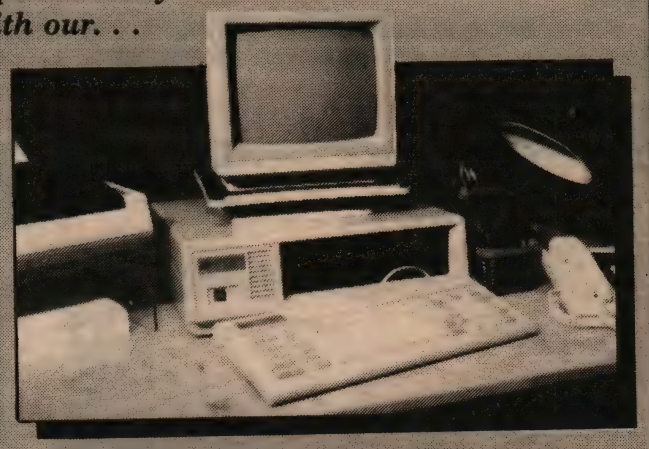
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IBM-MS DOS

Keyworks: Create Your Own Popdown Macro Menus

by Hal Nieburg

There are very few utilities that inveigle their way into the hearts of users and become necessary tools for everyday use. Like a Cole Porter or an early Beatles tune, some software become standards upon which every user soon depends. Keyworks is rapidly becoming a standard!

A stand-alone macro-menu machine, Keyworks (by Alpha Software Corp.), operates from RAM and provides Macintosh-like popdown menus from within any other active software. "Once you have tried it, you'll never let it go-o-o..." Whatever your software habit, this is a utility that adds effortless comfort and grace to the operation of a computer, and it is done with an elegance and economy that should be a model to programmers everywhere.

What Is A Macro?

Macros are labor-saving devices of growing convenience and importance! They are defined as "a means of invoking by a simple keystroke complex keyboard entry sequences."

Lengthy functions, such as those of DOS, can be performed with one or a few strokes, without the bother of exiting from active software screens into the DOS shell.

Software commands can be marvelously simplified and quickened, transforming any clunky multi-key function into a single dedicated keystroke. For example, in Framework, the user may wish to change the default drive. This involves going from a data screen to a directory screen, moving the cursor bar to the desired drive, then hitting Cntl-Enter simultaneously; then reversing the sequence to return to the data screen, for a total of eight strokes. With a macro previously prepared and loaded at the start of a work session, the user may change default drives all day with one or at most two strokes each time.

Large chunks of frequently-used text can be written into macros and entered on the screen, with but a single stroke, wherever needed. For instance, a set of names and addresses. Let us suppose office correspondence normally contains references to one or more of 25 different company subdivisions. The managers, addresses, telephone numbers, and special assignments/services can be entered into a permanent set of macros. A simple keystroke (such as Alt-25) can insert any of them in the correct form in a new document or letter.

Macros are contained in special files that list the macro name, and define a series of commands associated with the name. The latter will be read and executed when the name is typed on the keyboard. Macros can be loaded into memory at boot-up time, from an autoexec batch file, and, when the macro-command is given, access an interrupt and be executed, either within a DOS shell or on top of a program currently active; or they may remain on the disk, to be read and executed as needed.

Most new macro-capable programs, like Symphony, Framework, PC-Write, employ the former method, which is faster, but does impose a modern toll on available RAM.

Advantages of KW

Keyworks has several great advantages over the built-in macro-capabilities of much recent software:

(1) It is completely independent and can be invoked both in and out of programs. Thus it has multitasking applications and can be used in DOS as well, without the necessity of

continued on page 54

Canon's New Transportable MSDOS Personal Computer

Having entered the MSDOS market with the Personal Computer A-200 (both mini floppy disk and hard disk models), Canon USA has announced another Personal Computer model, a transportable unit that is compatible with the IBM PC.

Identified as the A-200 Transportable, the latest in a series of personal computers will be available this month for a suggested retail price of $2,295.00.

The A-200 Transportable weighs nineteen pounds, can be carried easily, and operates on AC. A carrying bag is optional.

The unit includes a built-in foldaway 80 column x 25 line text screen and graphic liquid crystal display with a resolution of 640x200 pixels. By utilizing an RGB Monitor Interface, an external color monitor may be used when color graphics are desired. Because the new computer has a 512k byte RAM (expandable to 640k byte using an optional expansion box and memory card) and two 5-1/4" 360k byte disk drives, the user has access to a large memory capacity.



Canon A-200 Transportable

The A-200 Transportable is IBM PC compatible and has an IBM-style keyboard layout. It will run many MSDOS software packages now available.

The A-200 Transportable comes standard with many interfaces for versatility, including a Centronics-type parallel interface and an RS-232C serial data interface, a telephone interface, acoustic coupler interface, expansion box interface, RGB monitor interface, and a composite video interface. Telecommunication projects are completed quickly and easily with the built-in modem.

Available optional items include an expansion box and hard disk kit. By connecting a 3-slot expansion box, a 10m byte hard disk drive can be mounted.

The A-200 Transportable comes with Canon's Personal Computer's standard one-year limited warranty.

continued on page 86

Turbo GameWorks & Gin!

Reviewed by
Dr. Michael W. Ecker

It seems that computer games are becoming increasingly sophisticated: better graphics, better error trapping and input checks, faster and sharper algorithms, and so on. One new wrinkle, however, is Borland International's idea of offering and promoting not just games to play, and not just source code to study programming, but a marriage of the two. That is, Turbo GameWorks offers both source code and compiled programs so that you may study programming and game creation from the source files even as you enjoy playing with the compiled programs. We'll look at this approach in this review. As for the Gin program, I can't swear as to the novelty of J. Baldwin Pontefract's offering, but as his company's ads promise, why not just have a little fun?

Turbo GameWorks

By now, everybody except Rip Van Winkle is familiar with Borland International and its approach to reasonably priced software, particularly as expressed in Turbo Pascal and SideKick. In the past year we've seen, and in the coming year we will continue to see (that's a prediction, folks) more applications from Borland Games. Artificial intelligence and who knows what else? I see Turbo GameWorks as fitting in neatly with this formula. It is in the best interest for Borland to do so, for such applications reinforce interest in other Borland products, such as GameWorks reinforcing interest in Turbo Pascal, and Turbo Pascal stirring interest in Turbo books, applications, and so on.

The Turbo GameWorks package comes with two disks inside a book with license agreement--a reasonable and fair one, incidentally. That agreement says that you may treat the disks as books. Just as you have a book in just one place at a time, so may you have only one user at a time. No more threats about one computer or one user--as long as it's only one user and computer *at a time*. Sounds reasonable to me, and this is becoming increasingly the norm with license agreements from Borland, Microsoft and perhaps others.

Implicit in all this is that this package is not copy protected. So, I made a backup copy for the usual safety reasons. Then I proceeded to check, via the TYPE command, the now familiar README file for last minute information on the three games on the disks. Chess and accompanying support and library files (e.g. a file of opening moves) appear on disk 1, and Bridge and Go-Moku are on Disk 2, each with its own concomitant files. Since the games have already been compiled, it is not necessary to have Turbo Pascal 3 (or 2 or 1) to play them. In fact, even to look at the source files you don't need Turbo Pascal, although it is nice to have it anyway in case you wish to do anything more than just look. In particular, you may edit those files. Personally, I considered the prospect of modifying such long and formidable-looking source files to be quite intimidating. Then again, to

continued on page 87

Framework II: Integration Revisited

by Hal Nieburg

It is time to look at program integration again. The advent of SYMPHONY and FRAMEWORK 18 months ago was ahead of the technology; but now the technology is catching up, and a reappraisal is at hand! Those of us who thought that integration meant too many compromises had better open our minds.

A third generation upgrade of both packages is now in the stores (SYMPHONY 1.1 and FRAMEWORK II) and a great deal has changed. Most significant, both are designed to access extended memory in the multi-megabyte (8M max.) range. Both are designed with "sparse cell" storage, meaning they can manage cell space with optimum economy, making vastly larger spreadsheets (and all data files) possible even without extended memory

Spreadsheet operations for both programs are now twice as fast as their earlier releases, and because of more efficient space use, can be two to five times larger with the same amount of RAM. Both can swap working memory between RAM and virtual or fixed disk, speeding up recalculations and allowing file sizes larger than actual memory. In addition, both have added many powerful and convenient new features.

With the introduction of the LOTUS-INTEL specification early in 1985, we witnessed the first breakout from the 640K PC/MS-DOS straightjacket, and megabyte memory will keep getting cheaper and faster. Now IBM and Microsoft are preparing for the debut early in 1986 of DOS 4.0 and 5.0, offering the unlimited capacity and speed of the so-called "protected mode" of 80286 and 80386 CPU architecture. ("Protected" means that simultaneous programs can run through the CPU without interferring with each other, each accessing separately huge hunks of memory.)

Unlimited networking, multi-user/multi-tasking will soon be "Old Hat." Very large programs with astonishing capabilities will run handily on desktop micros, and the world will stop using the term "memory hungry." Imagine every user with a small supercomputer, costing around $1000, on the desk or in the living room!

When that happens, integrated software will be the normal software of the industry. There will be no practical limit on program and workspace size; and users will insist that software be consistent, fully interchangeable, and seamlessly integrated. FRAMEWORK II (FWII) in its new release comes closest to realizing and forecasting the future.

Of the two competitors, both are improved in important respects. And both still have important shortcomings, and must be regarded as transitional. After using both at length, I must give the orchids to FWII. It has gotten leaner and meaner, more capable, and more exciting than ever. I predict it will not only overtake SYMPHONY, but will become a milestone and a model for future programming.

FRAMEWORK was the first integrated package (spreadsheet, database, dynamic outlining, communications, word processing, graphing, and a powerful program language) to actually achieve the purpose of integration, a single concept and set of commands for all operations and smooth intersection of all parts. In the original release, the database and the spreadsheet were severely compromised, but no longer. The new FWII shows consistency of quality across its whole range of operations, superior in many respects to any stand-alone products, including dBaseIII and LOTUS 1-2-3. The word processor is more fully implemented than its rival, but still lacks many of the amenities to which users of other products have grown accustomed.

Unlike other attempts at integration (such as OPEN ACCESS, ENABLE, INTEGRATED 7, etc.), FWII is not a creaking patchwork of programs ingeniously linked together, but rather, a single program with fluid interconnections and a single command structure. The multiple applications in their various frames are held together by dynamic outlining, a kind of interactive stem that links all the data and operation frames into a logical whole. Data from all applications is freely interchangeable. Multiple graphs, segments of spreadsheets can, with barely a pause for breath, be reduced in size and inserted into text documents; and text in all combinations can be organized into documents of all kinds.

Outlining, The Tie That Binds

Outlining acts as the overseer of all creative work, a work manager and report organizer that goes beyond superficial linkage to something more basic, the merging of ideas, the replication in the computer of the actual creative processes of the mind.

FWII points the way to the

continued on page 90

Keyworks
continued from page 53

first opening DOS shells.

(2) It can cut across every kind of program, to supply macros to those that do not have their own macro-capabilities, such as WordStar 3.3; and can be written for housekeeping programs, such as Norton Utilities. They can simultaneously deal with a variety of memory-resident add-ins, such as Spotlight, SideKick, PolyWindows. The user can streamline the command structures of the most ancient of programs to emulate the most advanced.

(3) And, most lovely of all, it permits the user to write his own little popdown menus, available at any time, with cursor-bar selection from keyboard or from a mouse. The user can thus import state of art features into every aspect of computer use. Writing a customized front-end desk-organizer (or hard disk organizer) is no problem at all!

Keyworks is not memory-greedy. The RAM-loading of the operating software is rapid at boot-up and, in it minimum configuration, occupies only 34K. With maximum macro storage, KW occupies around 64K. For example, a complex routine for accessing and setting up a printer (allowing all optional fonts, margins, line-spacing, etc. of the Epson FX-80), from within other active programs, takes less than 1K.

When KW is loaded, a buffer area is set aside to hold the macros. The default buffer can contain up to 380 macros and 7,000 keystrokes. These defaults are set by creating a configuration file, which itself occupies less than 100 bytes. At boot-up, the entire program will fit into any available memory addresses, without interfering with other programs resident in the stack.

KW Operations

At boot-up from AUTOEXEC.BAT, the logo appears, noting the invocation keys (which can be modified at the users' pleasure). Hitting these keys brings up the first KW menu in the upper-left corner of the screen.

Record a macro
List macros
Edit macros
Save macros
Get macros
DOS functions
Other options
Bypass next key

The commands in the menu in Fig. 1, I think, are self-explanatory. The LIST command brings up a further window with all the loaded macros shown by key assignment. A cursor bar and the Enter key will invoke any of them. Depending on function, this may in turn bring up other nested menus which operate in the same fashion. The EDIT command brings up a window with the actual ASCII macro, where it may be modified and saved back to disk.

The top command (RECORD A MACRO) provides a pain-free method of writing macros. Merely select this item, then punch the keys to be assigned to the macro. They type in the sequence of commands under real-time operating conditions. After completing them, invoke KW again. The menu in Fig. 2 appears:

End macro recording
Pause
Fixed pause
Record nested macro
Bypass next key
Cancel this macro

Select the first item to END MACRO RECORDING. It will now operate from RAM. To make it permanent, invoke the first menu again and select SAVE MACROS. Once done, routines can be invoked at will from GET MACROS; or can be loaded at boot-up by the AUTOEXEC.BAT file. The macros are saved in ASCII format. Once the user understands the conventions of form, the KW editor, or any ASCII word processor, can append, delete, change keys or titles, of one's macros.

The package provides sample macros which the user will want to add to his master program disks. Included, for example, is the printer setup macro for the Epson MX-FX series. In addition, KW performs certain DOS functions. Without leaving the active application program, the user can list directories, rename files, erase files, create and delete sub-directories, change logged drives or paths, format disks, etc.

Customized Popdown Menus

These are especially useful if one is setting up systems for less-experienced users. This can be accomplished in two ways: invoking the editor, and typing in the commands; or hitting the OTHER OPTIONS selection on the first menu. This brings up a second window.

Selecting MENU CREATION, brings up an elegant TEMPLATE for custom menu design, with up to 20 separate items per menu. User can decide on colors and borders of window, footer and header titles, and where, when invoked, it will be displayed on the screen. This is a tool that transforms ordinary folk into power users.

The OTHER OPTIONS selection offers other functions as well. TEXT WINDOW CREATION enables the user to put messages or instructions on the screen, in response to the request of users.

The designers have thought of everything and are willing to make it easy for neophytes to become designers themselves. When the text window option is invoked, the user is asked a series of questions whose answers define the parameters of the text window. This shortcut means the user can, for example, write his own popdown help windows for quickly-accessible technical support.

Also provided are options to reconfigure the utility without leaving active screens or reloading KW; suspending KW, erasing macros from memory or from disk; and finally, a fast and efficient FILE ENCRYPTION option is available, to make it impossible for other people to search your disks for information, even with such powerful tools as Norton Utilities.

Keyworks is rapidly changing my own way of working. It is truly a delight to see so little, do so much, with so little work. Any user will find himself infatuated in the first moments, and the attachment will grow as the weeks go by. Hail to another standard number to add to the repertory of great and abiding tunes! ●

APPLE

Ask The Guru

by Don Lancaster

I'll try to be around the *Computer Shopper* booth at the *West Coast Computer Faire* April 3-6 in San Francisco's Moscone Center. I am also hoping to speak on the *Apple IIe* and laser printing, but I may have already missed the paper deadline.

Stop in and say hi.

Let's see. I now have a new *Applewriter Cookbook* out from SAMS (#22460). If you can't find one locally, I have a few autographed copies on hand here that I could be persuaded to part with.

Again, our usual reminder that this is your column and that you can get in on the fun by writing or calling per the end box. I also have lots of neat freebies available for you if you call or write.

There's two very exciting new computer peripherals this month, so let's get going...

What's The Word On The New Laserwriter Plus?

The only real difference between the old *Laserwriter* and the brand new *Laserwriter Plus* is that eight formerly empty ROM sockets have been newly filled and a programming jumper got moved over.

Inside those new ROM chips are 22 brand new fonts that are most exciting and most useful.

Now included are two new gothic style fonts named *Avant Garde* and *Helvetica Narrow*. There's also three new Roman style fonts called *Bookman, Century Schoolbook*, and fancy *Palatino*.

Each of these fonts are available in normal, bold, italic, and bold italic variations. Rounding out this super font collection is a calligraphic font named *Zapf Chancery* and a collection of printer's icons and "dingbat" symbols.

All the old fonts are still there, including *Courier, Times-Roman, Helvetica*, and *Symbol*. The total number of resident fonts now total 35, when you add up all the variations.

But, before we go on, watch out *very* carefully for who is calling what a font.

On the gutless, imitation Laserwriter knockoffs, one font gives you only *one* size of *one* particular typestyle only in *one* page direction.

On a real *Laserwriter* or *Laserwriter Plus*, one font can be shown in any size from 2 points to 65,000 points in quarter point increments. The font may be shown in any direction or along any path, besides being stretchable, leanable, or twistable in any direction and capable of being outlined, shadowed, shaded, patterned, three-dimensioned, and who knows what else.

Thus, one *Laserwriter* font equals at least several billion knockoff laser printer fonts. That's assuming you are not very creative. If you are, then one *Laserwriter* font equals a totally ridiculous number of imitation knockoff fonts.

Beware of knockoff hype!

Back to the brand new *Laserwriter Plus*. Several very subtle bugs in the old ROMs were fixed in the upgrade. There also are some speed improvements of interest to those intent on using a new *Macintosh Plus* as a *Laserwriter* driver.

Using an Apple IIe still remains faster, however.

The *Laserwriter Plus* also proudly supports "downloadable fonts." However, this needs some clarification, for things are not at all what they seem.

You *always* had the ability to download custom fonts from an *Apple IIe* to the *Laserwriter*, either with each job or once on first power up. Thankfully, this ability still remains.

What has been added is a method of downloading a new series of extremely expensive, high protected, and strictly site-licensed fonts.

Since any idiot with a cheat book can easily scarf up his own downloadable fonts for the *Laserwriter*, I can see a real battle shaping up between cheap, unprotected, and unlicensed downloadable fonts on one hand, and very expensive, locked, protected, and site licensed ones on the other.

Yet this entire battle can be easily avoided by (A) removing ALL protection from both the fonts and font access, (B) eliminating needless and utterly unworkable site licensing, and (C) reducing the price of downloadable fonts below the level that makes using a cheat book so attractive in the first place.

Time will tell.

Several readers have asked what the internal Laserwriter computer looks like. Well, there are really two internal computers, one built by *Canon* as a mechanism controller, and one built by *Apple* as a Postscript interpreter.

The Apple manufactured computer is very big, very simple, and very awesome. A 68000 CPU with 1.5 megabytes of RAM and 1 megabyte of ROM. A total of 48 RAM chips and either 8 or 16 ROM chips. Two ports, one for the laser controller, and one for serial I/O.

A most unusual pair of stablemates as port chips: a 6522 along with — brace yourself — a Z80 SIO.

Presumably, some features are available in the Z80 chip that aren't available in the 6551 you would expect to find in this socket.

The ROM holds the Forth-like *Postscript* interpreter, along with the resident fonts. The "average" font uses around 12K bytes of memory, but this varies all over the lot. A "secret" compaction scheme has been used to squash the fonts down to this size.

Note that the bytes needed by the font description are completely independent of the final character size on the page. Further, only a single font description is needed for all possible output point sizes and image directions.

On the RAM side, one megabyte is used for the full page bitmap. Another 256K is used as a *font cache* that converts any currently active fonts into a character bitmap so they can be rapidly read. This solves the dilemma of having a very compact description of a font, yet still providing both a very high resolution and very fast imaging of the characters as they are needed.

What's New In Small Control Computers?

I just ran into a brand new control computer that I am really impressed with. It's called the *VIP* and is made by *Bukowski Robotics*. VIP is an abbreviation for *Very Intelligent Peripheral*.

It is a 65C02 of course. But with a crucial difference. Start with a bare bones 65C02 microprocessor and your usual 6522 sixteen line parallel port. No ROM. No dynamic RAM. Instead, 8K of *non-volatile* static RAM. The static RAM is faked by an 8K x 8 CMOS memory plugged into an "intelligent socket" that has a backup battery in it. Just the sort of thing you would want for a bare bones controller for most any dedicated or experimental use. Easily expandable to boot.

Now for the neat part. This computer is also a plug-in card for an Apple IIe!

To first develop your application, you plug the VIP into the Apple. The Apple takes over, letting you write to or read from the VIP, and turning loose all of the powerful Apple development tools, including EDASM, BUGBYTER, the disk drives, the printer, and everything else.

After your VIP is first programmed, you can haul it off to the "shirtsleeves world" (industrial control) where it belongs and use it as a

continued on page 135

Apple's New Color Monitors

by Philip Chien

When Apple announced a color composite video monitor which could also display 80 columns of text, I was skeptical. When I saw the Apple ColorMonitor in action, I was astonished. The new Apple ColorMonitor IIe and IIc really can display both color graphics and high density text on the same screen — without needing an RGB output.

Normally monitors can either display good color graphics, or text, but not both. Text displays require at least a 12Mhz bandwidth, but color displays are limited by the 3.58Mhz color burst signal, ensuring incompatibility beween the signals. RGB monitors eliminate the problem by eliminating the color burst signal. Since each signal is sent separately, no color burst is necessary and both high density text and color graphics can be displayed. Occasionally manufacturers have put both composite video and RGB inputs on the same monitor, and sometimes have even added a television tuner (see my review of the Sears 4084 monitor, *Computer Shopper* July '85 p166). Unfortunately most RGB monitors are usually fairly expensive, and require an adapter card for RGB output.

When Steve Wozniak designed the Apple II he included a composite video output with a 40 column 24 line display. Most Apple users purchased R-F modulators to use their machines with color television sets, which set the 40 column limitation. Many users wanted to use their Apples for word processing and programming applications which required 80 column displays, and several companies came out with 80 column cards. 80 column displays require more bandwidth than color monitors, and users purchased black and white composite video monitors.

In 1983 Apple introduced the Apple IIe. At that point Apple Computer felt that there was still a market for home users who would only need a 40 column display. An inexpensive 80 column card, and later an 80 column card with extra memory were available as options. Apple recently change their marketing policy and will sell the Apple IIe with 128K and an 80 column display, but will not sell a standard 64K Apple IIe by itself anymore. The unit can still handle the 40 column modes, but Apple Computer's marketing department has decided that most users need a machine with the extra memory and 80 column display. The IIe comes with a standard composite video output and the capability to attach an R-F modulator for users which want to attach their Apples to television sets. RGB boards are available as options for users who want to attach their Apples to RGB monitors.

The Apple IIc was designed as a machine for both home

continued on page 56

DataGraph 2001

by Philip Chien

Ever want to carry your Apple with you? Well, even an Apple IIc is too big to carry around--what really is needed is a computer on a "Dick Tracy" wristwatch. That computer and wristwatch are still in the future, but the Seiko UC 2001 is here. The UC 2001 is a LC digital watch with 2K of RAM. Although it doesn't have the capabilities of a computer, it can operate as a receive only terminal and display information such as schedules and memos, prepared on your Apple. As a bonus feature, the watch's interface module is a clock which can be read by DOS and ProDOS programs.

The UC 2001 is distributed by Creative Peripherals Unlimited, with the UC-2301 interface unit which attaches to our Apple. The package comes with the Time-Trax scheduling program, and even batteries, and a screwdriver to open the UC-2301 to install the batteries.

The UC-2301 is a slim high-tech box with a data indicator light, a write protect switch, a battery test button, a recessed area for the watch, and a mini jack for the computer's connection cable. On the Apple II series and Apple IIe, it attaches to the Game I/O. The standard cable which comes with the watch does not allow you to attach anything else to the Game I/O at the same time, but the Appendix with this article includes directions on how to wire a pass thru cable. With the Apple IIc the interface module attaches to either serial port. To download data to the watch, you put the watch down on a recessed area of the UC-2301. You then instruct the Time-Trax program to download your schedules and notepads, and press the transmit button on your watch. The wireless connection between the UC-2301 interface and the back of the watch- makes it very easy. No cables have to be attached between it and the watch, and the magnetic coil is very fast and reliable. Within a couple of seconds, your data will be in the watch. Even the contrast of the watch's LC screen is set from the Apple!

Once the data is in your watch it can be viewed by pressing the mode button, which will select between your notepads, schedule, and the watch's built in stopwatch and alarm functions. Four lines (ten characters per line) can be displayed at a time, and scroll keys will let you see the rest of your text. The watch's memory can be configured as two memo pads, a large schedule, or the memory can be split into two sections for a schedule and a notepad.

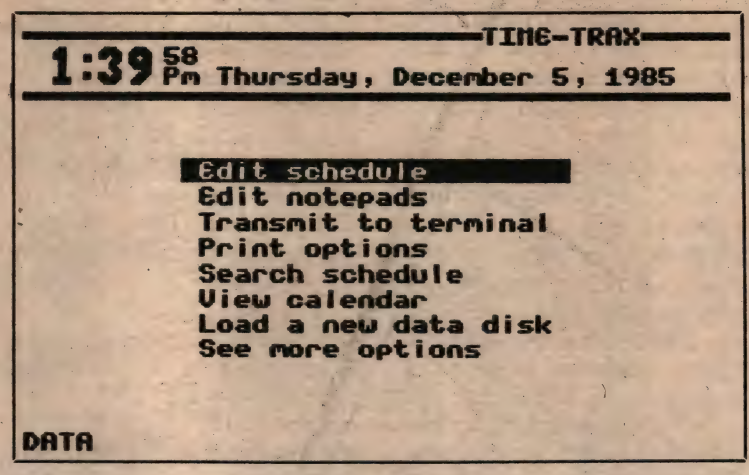
Time-Trax is a friendly schedule program. Appointments, meetings, holidays, and anything else important can all be filed in Time-Trax. Along with your schedules you can save "note pads" with any memos you want to carry around. The pictures show various screens from Time-Trax. Picture #1 shows the main menu with the time on the top of the screen, and the name of your data diskette on the bottom. The "more options" display will show the secondary utilities menu. Picture #2 shows the edit mode for the notepad. Lightface text is kept in the notepad, but not downloaded to the watch. Boldface text will be put into the pad. On the Apple IIe and IIc you can use the up and down arrows to move the cursor, but CTRL-A and CTRL-Z are added for Apple II Plus users. Picture #3 shows the edit mode for the schedule. Picture

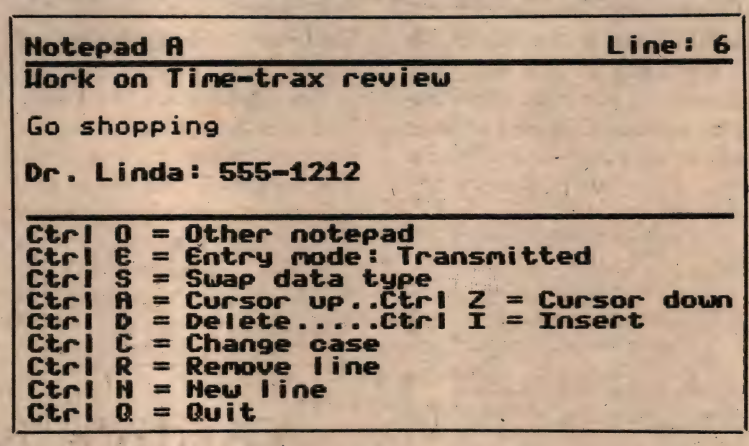
Photos 3 & 4 On Page 132

#4 shows my calendar for December. There is a tick mark on December 7 to indicate that I have an appointment on that day. The present day selected is the 8th, and the bottom of the screen indicates that it is Hanukah. Most major holidays are automatically included, and you can add your own personal holidays.

Once the schedules and notepads are downloaded, the watch will beep you whenever your appointments are due, or ahead of time if you want the watch to remind you that something is coming up. The present Time-Trax program is written in DOS 3.3, and is copiable (it even comes with extra disk labels for your backups!), but it is a stand-alone program. You cannot access the data from your own programs, and you cannot attach other routines to it. A new ProDOS version should be released fairly soon, and it will be more compatible with the rest of the world. If you like the Time-Trax program, but don't need to carry around your schedule on your wrist a separate version of Time-trax, with its own clock module but without the Seiko UC2001

continued on page 132





Apple's New Color Monitors

continued from page 55

and office environments. A composite video output (naturally) was included as the standard output port. The R-F modulator was available for home users who wanted to attach their machines to television sets. A special 15 pin connector includes all of the signals off the IIc's video generator. RGB adapters and special video devices like the IIc's portable LC screen can be attached to this port.

The one thing in common with all of the different Apples is the composite video output. RGB outputs are extra cost options on all Apples, and require special cables which composite video monitors don't need. The Apple ColorMonitor has a standard RCA video jack, and attaches to your Apple the same way a normal composite monitor would — with a fifty cent RCA-RCA cable, and not with extra interface cards. The secret to how the monitor does its magic is inside the monitor's case. Even though the monitor has a composite video input on the outside, internally the monitor is actually an RGB monitor. The monitor "looks" for the 3.58 Mhz color burst. If it finds it then it assumes that color text is being sent, and it converts the color composite video into RGB video and displays it. if it doesn't find a color burst signal, then it assumes that a black and whtie display (text only) is being sent, and displays it properly also. There is one limitation though, if you are sending a combined display of graphics and text, then the text is limited to the 40 column format, 80 column text, whether plotted onto the graphics screen, or on the bottom of text window will show up as a blur.

Since the monitor automatically detects the color burst, it is totally transparent to the end user, and will automatically work with any Apple, and most other computers which can send out black and white text along with graphics displays. A High-Resolution text switch "tells" the ColorMonitor that you are sending text only, if your Apple somehow confuses the monitor's color burst detector (e.g. color fringed text seen on early Apple IIs).

Two separate models are available, the ColorMonitor IIe, in an Apple beige case, and the ColorMonitor IIc in an Apple IIc white case. The IIc monitor has an optional stand for placement on top of the IIc, and the IIe version will sit directly on top of any other member of the Apple II family. Internally both monitors are electrically identical, and either unit will work with any member of the Apple II family, and most other computers with composite video outputs. The monitor also works well with the Video Videoterm and Ultraterm cards (see January '85 *Computer Shopper* p. 63 for a review of the Ultraterm) in the standard modes (24 lines of 80 characters). The ColorMonitor is legible in the Ultraterm's 24 and 32 line modes, but the 48 line mode is difficult to read.

The best surprise about the ColorMonitor is the price — $399, not much more than the $350 which most companies charged for normal composite monitors a few years ago. The monitor is more expensive than normal black and white monitors; but, if you already have an Apple with an 80 column screen and want to add color video, or if you are using a color monitor or televison set and want an 80 columnn display, or if you are just purchasing a new computer, then the ColorMonitor will probably be the best way to go. For most of my customers who need both 80 colum text and color video, my recommendation has been to use a black and white monitor for the text, and a television set or color monitor for graphics. My recommendation has just changed to get an Apple Color Monitor for both purposes.

Product: Apple ColorMonitor IIe & ColorMonitorIIc

Distributor: Apple Computer Inc., 20525 Mariani Ave., Cupertino, CA 95014. (408/996-1010)

Specifications:

Video bandwidth: Color mode 3 Mhz, B & W mode 12 Mhz.

Automatic mode selection. Manual B&W override switch.

Retail price: $399, Optional stand for IIc $25.

Hardware requirements: any Apple, or computer with a NTSC composite video output.

Warranty: 90 days, Applecare extended warranty $60/year.

Summary: 13" color monitor which can also display 80 column text within restrictions. ●

Apple Monitors Specifications	IIe	IIc
Width:	36.7 cm (14.4 in)	34.0 cm (13.4 in)
Height:	31.5 cm (12.4 in)	31.5 cm (12.4 in)
Depth:	37.5 cm (14.4 in)	36.5 (14.4 in)
Weight:	12.5 kg (27.5 lb)	12.5 kg (27.5 lb)
Screen size:	33 cm (13 in)	33 cm (13 in)

MACINTOSH

New Macintosh Offers Increased Speed, Memory, Storage And Expandability

Enhanced Laserwriter Also Introduced



Macintosh Plus™ and Laserwriter Plus™

At the 1986 AppleWorld Conference, which opened January 16, 1986, Apple Computer, Inc. introduced a powerful new member of its Macintosh personal computer family--the Macintosh Plus--that offers users increased speed, memory, storage and expandability. In addition, Apple announced a series of upgrades and programs that provide current Macintosh owners a variety of growth paths to the Macintosh Plus.

The Macintosh Plus has the same compact design and distinctive, visual user interface of other Macintosh models, but provides one megabyte of internal memory and 800 kilobytes (K) of disk storage capacity. The new computer's storage capacity can be expanded further with a wide variety of peripheral devices, including high-speed storage systems based on the Small Computer System Interface (SCSI), an industry-standard interface for peripheral devices that is built into the back panel of the Macintosh Plus. Software applications run up to 50 percent faster on the Macintosh Plus due to its larger memory, improvements in system software and new internal disk drive that can access data faster. A new keyboard provides a numeric keypad and directional arrow keys for cursor control.

"Earlier this year we promised our customers that we would take steps to make the Macintosh line more powerful, in part by expanding its compatibility with products from third party developers. The Macintosh Plus, with its SCSI port, is an important step in this direction," said Delbert W. Yocam, executive vice president of product operations. "With the addition of greater memory, storage, speed and expandability to the Macintosh product line, customers who are attracted to Macintosh for its intuitive operation and unique graphics capabilities can take better advantage of the more than 1,000 powerful software applications that are now available for Macintosh. In addition, we're providing upgrade kits and programs to our Macintosh installed base that allow them to add all of the Macintosh Plus features to their computers and grow with us as we expand the Macintosh system's capabilities."

The Macintosh Plus is compatible with almost all of the leading software programs developed in the past two years for the Macintosh line. Apple is working with the companies whose Macintosh products are not compatible with the Macintosh Plus to revise their products.

Apple's new Macintosh Plus also supports all Apple Macintosh peripherals--the LaserWriter and new LaserWriter Plus printers, the ImageWriter family of dot matrix printers, the Hard Disk 20 and all of Apple's modems--as well as a growing number of third party storage systems, printers and communications products. An AppleTalk network connector is built into the Macintosh Plus, and it supports all current third party AppleTalk products.

Apple also outlined a series of upgrade options and programs for current Macintosh and Lisa computer owners that allow them to take advantage of the technological advancements in the Macintosh Plus.

Owners of Macintosh 128K and Macintosh 512K computers can add all of the Macintosh Plus features to their systems by purchasing one or more of the following upgrade kits:

The Macintosh Plus Disk Drive Kit doubles disk capacity, increases system speed and provides the new system software. The kit, which requires dealer installation, includes a double-sided, 800K internal disk drive, the new ROM chips, the Macintosh Plus System Tools Disk and a guide to the new features.

The Macintosh Plus Logic Board Kit is for Macintosh owners who want one megabyte of internal memory, the option of expanding to up to four megabytes in the future, and the SCSI port. A new main logic board, new rear case to accommodate the new parts, an adapter cable and the Macintosh Plus Owner's guide are included. To take advantage of the Logic Board Kit upgrade, which also requires dealer installation, existing Macintosh customers must purchase the Disk Drive Kit as well.

The new Macintosh Plus Keyboard also can be purchased separately for those Macintosh users who need the built-in numeric keypad and cursor keys.

In addition, to support its U.S. customers who recently purchased Macintosh computers, Apple is offering special rebates on the Disk Drive and Logic Board Upgrade Kits.

Macintosh XL and Lisa computer owners cannot take advantage of these Macintosh Plus upgrade kits, but to abide by its commitment to support its customers, Apple is offering these users in the U.S. the option of trading in their systems for a Macintosh Plus and a Hard Disk 20 at a substantially reduced price through authorized Apple Macintosh XL/Lisa dealers.

Memory and Storage Capacities Increased for Businesses and Universities

The Macintosh Plus has one megabtye of internal memory and a new, internal floppy disk drive that provides 800 kilobytes of storage for applications and files. In addition, the system's capabilities can be expanded through a wide range of new peripherals that connect to the Macintosh Plus via its SCSI port, making it easier for users to customize their systems to meet their specific needs.

With a full megabyte of memory - equal to about 500 pages of text - the Macintosh Plus can handle very large spreadsheets, data bases, graphics and text documents. Software that requires large amounts of memory, such as integrated applications, execute operations faster because more of the program and data resides in memory at one time. Apple's Switcher utility program can run more applications at once more quickly and can cut and paste across a greater number of documents. Switcher allows Macintosh users to store several programs at once in the computer's memory and instantly switch among them, providing a fast, simple method for transferring data and moving among applications.

In addition, the internal memory of the Macintosh Plus is designed to be expanded to up to four megabytes when high-density, one megabit random-access memory (RAM) chips become available in quantity.

The system's double-sided floppy disk drive provides 800K, or about 400 text pages, of storage. Users can put more applications and documents on a single disk, leaving fewer disks to swap and manage, as well as install more printer fonts and desk accessories. The new drive can access data faster than the single-sided Macintosh drives and is also available as an external, add-on unit.

The new drive can read either double- or single-sided 3-1/2 inch media, enabling it to run current Macintosh software. Double-sided media also can be formatted for use in the single-sided drives (on one side only), which are built into the Macintosh 512K system. Apple will offer applications, such as MacDraw and MacProject, in both single- and double-sided formats during 1986, and it expects other software publishers to offer double-sided versions of their products as the number of installed Macintosh Plus systems in-

continued on page 136

MacUniverse

by L.J. Kutten

New Apple Products

By the time you read this, Apple Computer should have released its new Macintosh model, called the Macintosh Plus. It will have: (1) one megabyte of memory which can be expanded to 4 megabytes; (2) double sided 800K disk drive (current drives are 400K single side); (3) a SCSI (small computer system interface) for the connection of third party peripherals such as hard drives and digitizers; (4) a built-in numeric keypad; and (5) a 128K ROM with hierarchical file structure. No price has been announced but my sources tell me current 512K units should be upgradeable for approximately $1000.

Three Games

Activision is attempting to build itself into a power in the Macintosh game arena. Unfortunately, I have not been too impressed with their products to date. Their most bizarre product is a "simulation" called Alter Ego. This program allows the user to pretend to be someone else without suffering the consequences. The program supplies the user with life experiences from birth to old age. Responding to the questions, the user can answer either as himself or someone else and learn the outcome without having to pay the real-life consequences of his decisions.

The program begins by establishing the player's personality in Alter Ego's simulated world. As the player responds, Alter Ego develops a profile on which the life experience will be based. Among the areas covered are social, intellectual, emotional, physical, family, and vocational. A player may begin at any one of the seven stages of life and is presented with situations to which he must react.

Alter Ego is currently available in a male version which has a suggested list price of $39. A female version will be released in late March.

Hacker is another Activision program. This is a graphic adventure that uses the gimmick of the player "hacking" into the private computer system owned by Magma, Ltd. Supposedly this gives the player the vicarious thrill of being a hacker. Do not let the title fool you. It is exciting as a dead computer.

Hacking into Magma's system is not difficult. In fact, the player has to work hard not to break in. Once broken into, the player must answer a few questions (solved solely by trial and error). The game then begins and the player is advised of the mission--to recover a shredded document containing secret information which will adversely affect Magma's plan for global domination. Using the mouse and keyboard, the player controls a robot which travels around the world via a set of subterranean tunnels. After popping up in various countries, the robot negotiates with a series of spies to (1) buy parts of the document and (2) trade for goods that other spies may demand for their portion of the document. Confusing the issue is that while each spy requires one particular object, several spies may accept items which other spies may require.

At first the subterranean tunnel systems appears to be a maze. However it is simple to navigate once you get the hang of it and if a player is very observant, the video screen will display a clue as to possible directions to move.

Hacker has no manual. The rationale for this is that no real hacker would have one. Not having a manual is not a hindrance: there are very few commands which are obvious. In the same genre, there is no means of saving a game. If you get tired or get kicked off the system, you have to start all over.

I found Hacker very boring. Once the gimmick of being a "hacker" grows old, this game quickly becomes a standard adventure game that utilizes some basic graphics. As an adventure game, I feel it is poor-

continued on page 143

QuickStick

Review by L.J. Kutten

QuickStick, by Kraft Systems, is a high quality joystick designed by Kraft Systems as a replacement for the Macintosh mouse. Designed to function as both a mouse and joystick it valiantly tries to offer the best of both worlds, yet fails at both.

As a joystick, tilting the stick, and not movement of the mouse, determines the location of the pointer on the Macintosh screen. Push the stick to the left and the pointer goes to the left, push it to the right and the stick goes to the right, and so on. Double clicking the joystick's button is the same as double clicking the mouse button.

The unit is solidly constructed with no visible means of disassembly. It is approximately four inches wide by four inches deep and does not need a large area, like the mouse, to be functional. Because it has four, non-slip rubber feet, it does not slide about when the stick is pushed in any direction. The unit has two buttons, one located on top and the other the front of the unit. These buttons serve identical purposes and are the equivalent of the mouse button. There is also a small slide switch on the front of the unit marked "M" (for mouse) and "J" (for joystick).

The QuickStick comes with a limited one year warranty except a service charge may be incurred for bent connector pins or broken cable.

Center-Lok Mode

The QuickStick comes with kraft's patented center-lok mode. When activated a tension device makes the stick hard to tilt. And when it is released, the pointer automatically returns to the center of the screen.

Attaching the QuickStick

The QuickStick is designed to replace the mouse and uses the same 9 pin "D" port on the back of the Macintosh. Attaching the QuickStick is easy. First turn off the Macintosh and disconnect the mouse. Attach the QuickStick in its place. Turn on the Macintosh and select the "Control Panel" desk accessory from the Apple menu. Set "Mouse Tracking" to 0 and you are done.

Using the QuickStick

As far as this reviewer can tell, using the QuickStick offers no advantage over the mouse other than it uses less desk space.

In the joystick mode, my hand quickly got tired fighting the pressure of the center-lok mode. With center-lok off, it became almost impossible to control the absolute location of the pointer as it tends to drift after pressure on the stick is released.

In the mouse mode, using the center-lok mode is extremely counter productive. For example, when using Microsoft Word, no sooner would I mark a block of text than the center-lok would cause a even larger block to be marked before I could release the button.

The only possible advantage

continued on page 147

Wheels For The Mind

Review by L.J. Kutten

The third issue of *Wheels for the Mind* has just been released by Apple Computer. Originally designed as a newsletter/clearing house for schools belonging to Apple University Consortium, it has been expanded into a quarterly journal to cover news and information from all college level schools desiring to learn more about academic uses of the Macintosh. Broken into three main areas, the Dialog Box, Works in Progress, and the Macintosh Products, it provides a unique overview of the Macintosh world.

Both the Dialog Box and the Macintosh Products sections are superfulous to the purpose of *Wheels*. The Dialog Box presents articles on a wide variety of general Macintosh topics ranging from local area networks, information about new releases of Apple software for the Macintosh, to strategies for involving faculty in microcomputers. Most of this information is readily available from more accessible sources. The Macintosh Products section provides information about third-party Macintosh hardware and software. Besides informal opinion, citations are given to magazine reviews of major products. For example, it list at least two different reviews for all of the major databases currently available.

It is the Works in Progress section that makes *Wheels for the Mind* really shine. This section describes various projects either completed or in the works at a number of schools. Academic areas include Astronomy, Biology, Chemistry, Computer Science, Design, Economics, Engineering, Fonts, History & Politics, Humanities, Languages, Management, Math & Statistics, Medicine, Music, Networks, Nutrition & Food Sciences, Philosophy, Photography, Physics, Sociology, Telecommunications, and Word Processing. The number, variety, and scope of programs available is simply amazing. Consider the following three examples:

Chemistry students will appreciate a molecular editor compiler developed by Drexel University in Philadelphia. It allows the student to build molecules or crystal structures up to 99 atoms. These are displayed in a three dimensional ball-and-stick representation and can be rotated about any of three axes.

Students of Armenian, Cyrillic, Devanagari, Hebrew, Gaelic, Greek (classical or modern), Polish, Russian (following either an American or Russian keyboard), mTail, Ukranian, and Vilne will want to order fonts from either Wayne State University in Detroit or the University of Chicago in Chicago. These are available at a nominal fee.

Beginning music composition students will be interested in a program called "Mozart." Developed by Dartmouth College in Hanover, New Hampshire, it allows a student with no formal experience in music composition the opportunity to experiment with musical arrangements, the user can compose a minuet from any of six pre-defined two-measure phrases written by Mozart. The arrangement of the phases, tempo, articulation, and dynamics are controlled by dragging items from four palettes onto the musical staff. The minuet can be played on the Macintosh, saved to a disk, and even printed out on an Imagewriter.

Wheels for the Mind is currently available free of charge from most college bookstores that belong to Apple's University Consortium or are part of the University Purchase Plan. Some stores may require a school ID to get a copy. It is also available from Apple. ●

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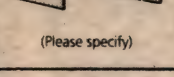
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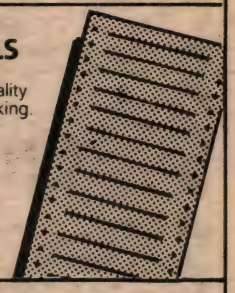
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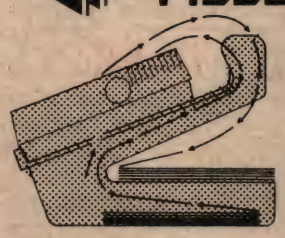
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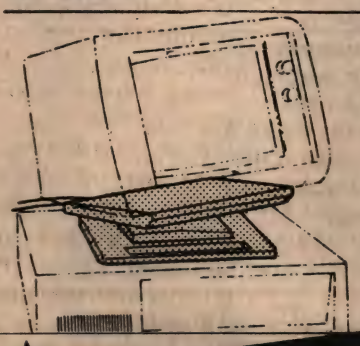


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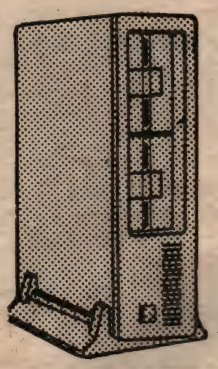


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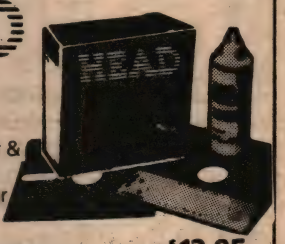


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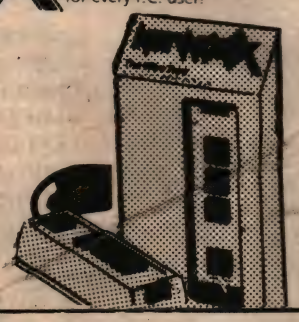


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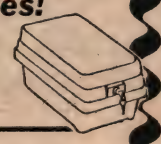
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COMMODORE

Inside Commodore

by Ted Drude

This month we will be presenting a deluxe "User Port to RS-232" interface card that's inexpensive and fairly easy to build. You can use this interface to connect "third party" RS-232 printers, plotters, modems, and other computers to your Commodore 64. (The interface also works with VIC-20s and C-128s.) We also have some CES news, a retraction (yes, I am human), and some other strange ideas to bounce around.

Are We Abandoning Commodore?

Some of you who read this column every month, might have been a little surprized at some of my comments at the end of last month's column. I did a brief comparison between a fully expanded C-128 (2 drives, 512K, RGB monitor) and a similarly equiped IBM-PC compatible "clone." As some you saw, when comparing the price of the hardware, some PC clones are very competitive in price compared to high-end C-128s. I am not implying that they are necessarily better or more desirable than a C-128!

For the C-64 owner who already has a lot of time, money, and effort tied up in Commodore software and hardware, the C-128 is a much more logical choice than a PC clone, if you want to upgrade to a higher powered system. My final comments were that we should be aware of market conditions and hope Commodore decides to lower the C-128's price so that it won't get clobered by the competition in the coming year. I wasn't trying to denegrate Commodore products. Instead, I was just trying to be honest about the reality of market conditions facing them.

The Commodore RS-232 Interface Project
The "Kludge" Approach To Interfacing

When Commodore designed the VIC-20, they originally intended to put an "industry standard" RS-232 port on it, using a 6551 UART chip, standard voltage levels, and a DB-25 connector. Somehow, (read "cost cutting") it got left off. Instead, a non-standard hybrid "kludge" of software and hardware was thrown together at the last minute to simulate an "pseudo" RS-232 interface through the User Port. This kludge approach saved Commodore thousands of dollars, but it also kept the VIC from having a "real" RS-232 port.

When the C-64, and C-128 were designed, Commodore, instead of realizing they had gone cheap with the VIC, decided to go the same "kludge" route. Although often advertised as a "real" RS-232 port, the kludge in reality, only directly connects to the Commodore Modems (1600, 1650, 1660, 1670 and "compatibles").

Adding The Missing Pieces

In order to use connect third party RS-232 devices (like high speed modems, printers, or plotters) to your Commodore, you need extra hardware to do the job. Commodore realized that some users might actually want a real RS-232 port. Knowing that the actual hardware involved in adding a real RS-232 port, might cost them $10 or so (at the quantities they buy), they decided not to charge "too much" for it. So they graciously provided the extra hardware in a cartridge...for "only" $50! Nice of them...ehh? This cartridge (called the VIC-1101A) is in very short supply now. It appears that it may be out of production. (How many people want a $50 cartridge for a $100 computer?)

Well, for those of you who weren't taken for a ride ... err...who weren't "privileged" to buy the VIC 1101A, don't worry. You can now build your own RS-232 interface card for about half the price, with more features. That (strangely enough) is this month's technical topic, building a "deluxe" User Port to RS-232 interface.

Using parts from one of the many mail order houses that advertise in the *Computer Shopper*, you should be able to keep the cost under $25. It may run a little higher if you buy everything from your local Radio Shack, but almost all the parts are available there, too.

The actual external hardware interface circuit you need varies depending on whether you are using a "3-line" interface, "X-line" handshaking in-

continued on page 62

"The World of Commodore III" — The Show

by Dr. Seth E. Many

In 1983, fresh from initiating a completely **unauthorized** Commodore-based high-tech retail store in Sharon Springs, NY (where did you say?), I decided to go to the WOC-I (World of Commodore Show), held every December in Toronto. It was both helpful and **exasperating.** High Canadian prices meant no buying opportunities. But the range of offerings bouyed the spirits and educated the retailer. WOC-II was less hectic, almost prosaic. Dare I mention the C16 or the Plus/4? But 3rd-Party Development was peaking, and initializing-enthusiasm was replaced by solid development. So here it is Dec. '85 and WOC-III. Take a look at WOC we got!

The **Amiga** ($1995 with built-in disk drive), RGB monitor & 256K RAM expansion is front and center-stage. Noisy and colorful demos of "almost" released software (Aegis **Animator** $80, Electronic Arts **Deluxe Paint** $50), and hardware add-ons, e.g. the Commodore **Genlock** $249 (Feb. 86) overlaying computer graphic images on top of a VCR production; the MIDI (Musical Interface Device) cranking out robot rock or Greensleeves, out-sync-ing a hairful human keyboard performer.

Enable ($495) for Amiga, the highly rated integrated productivity tool, was glaringly *inevident,* and the PC-10/20 (IBM clone not in US) was bearing the brunt of the business attack. Jeff Porter, a new generation Commodore rep. was sincere and knowledgeable, but given shakedowns of Commodore past, rampant

continued on page 62

Amiga? Todavia No...
(Translation: Friend? Not Yet...)

by Al Koller

It is called "Amiga" — Spanish for "friend" — and it represents Commodore's newest technology for the personal computer market. Touted as the most powerful and versatile personal computer ever made, Amiga(tm) may be a dream come true for hackers, musicians, artists, and businessmen alike. Or it may be one of the biggest and most expensive disappointments of your life. It all depends on your needs and your point of view. This is a hands-on, personal view of owning and using a "production" Amiga purchased from a local dealer and used in my home. What's it really like? Read my story and judge for yourself!

Our Amiga adventure began during the Thanksgiving holidays when, after three years as a Commodore 64 owner, I decided to upgrade to the Commodore C-128. The new machine met all my expectations, fit into our system set-up perfectly, and performed exactly as expected for about three weeks. Then one evening I arrived home from work to find my youngest daughter upset because she had "lost" the term paper she had been working on. Next evening I arrived home to a repeat performance, this time from our 20-year old who used the machine to do her term paper for college, with the same results as her sister. Convinced that it was the machine, we returned it under the remaining warranty from the store from which I bought it (one advantage of a local purchase!), and then I made one of those crossroad decisions we face so often in life. I decided that the opportunity had come to really upgrade and began thinking in terms of other systems for the future.

Since the holiday season was in full swing, it seemed likely that we could do without a computer for 3-4 weeks and take advantage of the post-Christmas prices. WRONG!!! After only two days we found it unbearable to be without the old stand-by. Suffering what my wife called "withdrawal symptoms," we survived Christmas without any computer at all, but it was TOUGH. The day after, December 26, we braved the crowds to shop in earnest for a new machine. Clearly, we were desperate. One day later we bought an Amiga at full retail ($1295), a 256K RAM card ($195), a word processing program ($99.95), a box of 3 ½" disks ($39.95), a disk holder ($25), and a printer cable ($27) for a grand total of $1782.82 including tax, title and tag. What a blowout!!! (You need to remember, we are traditional Commodore people. Anything costing over $29.95 is crazy!.) There were some second thoughts as we drove home, but all those doubts were quickly washed away as we unwrapped our purchase and began the fun of setting up the newest computer system which exists today, in the privacy of our very own home. Even my wife was supportive, probably because she was tired of hearing complaints and having to put up with our "withdrawal symptoms." In any case, that was how it all began...

The Amiga Unveiled

The Amiga Model A1000 is packaged in a large box containing the rectangular CPU, a keyboard, a coiled cable resembling a modular telephoto cord, and a two button mouse. A 3½" disk drive is built into the main unit. The system comes "bundled" with four disks to get the user started. They include: a "Kickstart" disk containing the operating system which must be booted into the 256K system RAM (leaving the user a second

continued on page 108

Inside Commodore
continued from page 61

terface, connecting to a modem, or connecting to a printer. We are going to present a circuit that can work with any of the above combinations. It is a "deluxe" interface that can easily switch from a modem to a printer interface.

Theory of The Interface

As I mentioned, the Commodore "RS-232 Interface" (which I affectionately refer to as the "kludge") is supposedly a software / hardware emulation of a 6551 UART (Universal Asynch Receiver Transmitter) chip. At slow baud rates, it does a fair job of emulating a 6551. As long as we are satisfied with baud rates of 1200 or less, we don't need another external UART chip. The "kludge" will at least handle that part of it. But, we do need to add some other chips.

Commodore uses some of the parallel lines of the User Port CIA or VIA chip to implement the serial port. Those lines are TTL level (0 to 5 volt) signals. The RS-232 standard uses completely different voltage levels (−12 to +12 volts). So, you need a "TTL to RS-232" level converter. You also need to invert the TTL level handshake lines, because the Commodore software UART expects them to be the opposite of what a hardware UART does. (What else is new?) Fortunately, there are three commonly available IC chips that can do the job for us.

In addition to the IC chips, you will also need to add a DB-25 connector and/or cable. This is because its the standard RS-232 connector, and everything but a Commodore modem won't hook onto the edge connector of the User Port. Just like the chips we need, the DB-25 connector is a very common part.

Circuit Description

I didn't develop an etched PC board, since this was a prototype. (Refer to Figure #1 for parts placement diagram.) Instead, I used wire-wrap construction throughout. All of the ICs and DIP switches were mounted in wire-wrap sockets. The 26 pin header I used is also available in a wire-wrap design. (I used a solder tail length for it on my prototype, and soldered the striped ends of the wire-wrap to it.)

The interface is constructed on a protype PC card that is soldered to a female 12/24 pin edge connector that mates to the User Port. (I cut a Radio Shack #276 - 1551 edge connector down to size.) This is similar to the parallel printer interface we constructed earlier. I used a Radio Shack #276-152A card. Radio Shack has just started now selling another card that may be better suited for this project (RS #276-187). It has the advantage of being bigger and allows you to directly solder a right angle DB-25 connector (like RS #276-1521) onto it. If you want to add a hardware UART, RAM buffer, and external CPU for your interface, there's plenty of room on that card, you can go wild!

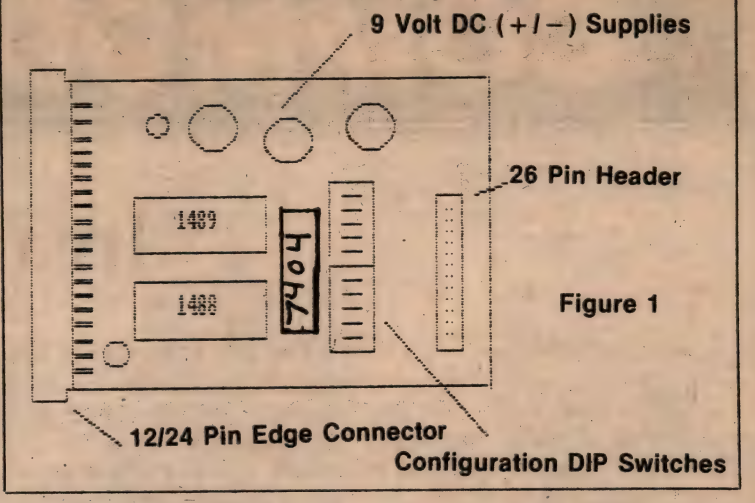


Figure 1

The circuit itself is fairly simple. (Refer to Figure #2 for schematic diagram.) Three ICs and a handful of discrete parts are used. The "U3" 1489 is a quad RS-232 to TTL line receiver, the "U2" 1488 is a TTL to RS-232 quad line driver. The "U1" 7404 hex inverter is needed to correct the backwards levels of the Commodore handshake lines.

like a terminal (DTE) so that it will work with a modem. By simply re-setting the DIP switches, you can re-configure the interface as a "null modem" (DCE) device and communicate with printers and other computers. In addition, the DCD and RI lines can be made to inputs or held high. The DIP switches flexibility keeps you from having to construct different cables that have "hardwired" configurations. Instead, you can instantly switch from one configuration to another.

Since the DIP switches are mounted in wire wrap sockets. You can use the extra long length of the wire wrap legs as an additional configuration device. By connecting the right legs together with wire wrap

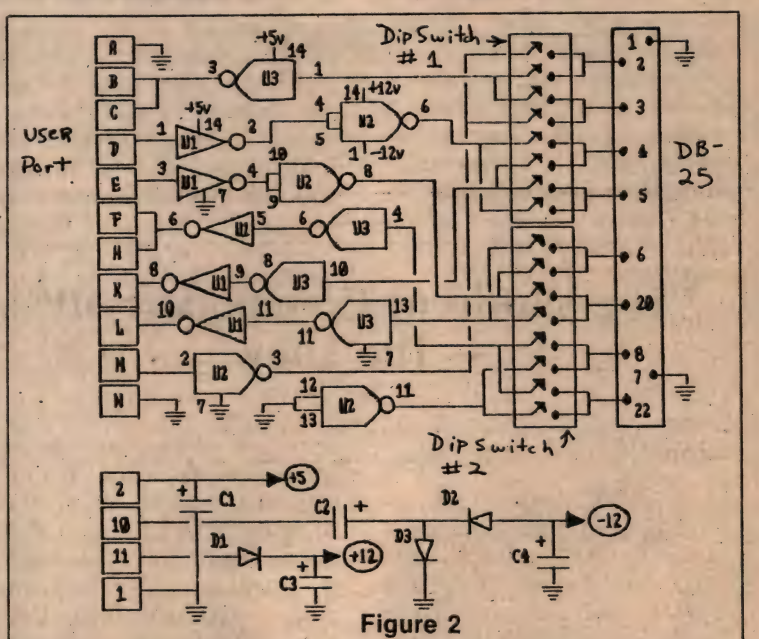


Figure 2

All power for the interface is provided by the User Port. Three 100 ufd./35 volt electrolytic capacitors and three 1004 diodes form a voltage source for the −12 and +12 voltages needed for the RS−232 lines. The 9 volt lines on the User Port are rectified and filtered for this. Another electrolytic capacitor filters the 5 volt line for the ICs.

Two 8 position DIP switches are used as configuration switches. All 16 positions are used. The "big eight" RS-232 lines (as Joe Campbell calls them) can be toggled through these switches. The switches can be set to allow the User Port to act as you can hold any lines permanently high or low. You can also have more than one line driven off the same output or input. This flexibility simplifies the difficulties of RS-232 interfacing easier.

The Parts List

Most all of the parts of the circuit are available from Radio Shack for those of you who are too anxious to wait for the mail or UPS. If you can wait a few days, you will find the parts are a lot cheaper from one of the mail order chip houses that advertise in the

continued on page 110

World of Commodore
continued from page 61

product discontrol and disinformation are not easily forgotten. Yet the eye must believe, and graphics are a magnet for unfulfilled (computer) lust. They are superb! And the machine is fast! Long live the Amiga. One new product, **AnswerMate** ($200) from Commodore will answer calls (in either tape or digitized voice), track outgoing telephone calls, and offer you a running bill. This could be a real *sleeper!*

The **C-128** shares the spotlight. Less dramatic, but more to the price point, a good 1000 square foot running demo programs all without joysticks (so common folks won't mess up!). Oh yes, I did see an 80 column icon-controlled **Jane Calc** $99 spreadsheet, so maybe all is not lost. Nobody seems to know if **Fancy Font** from SoftCraft, a player in the MSDOS (IBM) world will go in its CP/M 2.2 version on the 128. And where in this WOC is the oft promised **Perfect** series (Calc, Writer, DBM). Or did I miss something?

Steve Punter is here, kicking off his new **WordPro 128** ($79) with more of the programming skills that have made his work successful. When I tell him **Write Now** ($49) is my favorite word processor, he scowls. Then, scathingly: "you probably even like pull down menues!" (A pull-down put-down?) You see, my problem is not the learning curve, that is necessary and unavoidable. No it is the *forgetting curve* that makes me pause. I forget programs and keystrokes faster than 7.8 MHz (the clock speed of the Amiga).

Now, lets get on and see what is new for the **C-64** ($150). Ah, the C64. I like thinking, "if only...some enhancements (a RAM disk), some software (a good cattle-feed program for my rural cornstituents or Anadents **Neurologic Exam** ported over from the Apple), some great take offs (has anyone seen Megasoft's **X-Rated Cartoons or Graphics Library** $25...not at this show! Commodore seems intent on committing hari-kari on golden pond! Turning its back on a toy- soiled past. Hey, not so quick! Here are intriguing quality programs (like **Printmaster** $29; **Bodyman** $40; **Winter Games** $34, and **Vizastar**, $119)! More than ever before. Don't bury the poor chippie yet, she's still breathing. But what if, just think, if they held a funeral and nobody came?

Paradox?

1. My VIP badge at check-in was produced by a *typewriter!* Wow! If only they could convince us gullible public that computers are useful/necessary!?! **Magic(?) Desk** $49 to the rescue!

2. My VIP badge! If only **Commodore** really treated small village retailers like this...

3. **AmigaWorld** being given away *free* by **RUN** mags. They should pay us to read it! It is unmitigated tripe-hype, 3 issues full!

Expunged But Not Forgotten

1. Jack Tramiel, founder of Commodore, now Robin Hood, leader of the Atari 520ST band.

2. The Plus(What?)/4.

Early Risers:

1. **NewsRoom** $49: finally released for the C64 with accompanying Newsroom **Graphics Library I** $29.

2. **Paperback Writer 128** $59: WYSIWYG (What You See Is..., etc.) word-processor winner of the year.

3. **Vizawrite 128** $89: due out this week (Dec. 15), connects to your HP-Laser Printer!

4. **DigitEyes** $119: can now send digitized files from **Koala** ($79), your video-camera, or whatever to **Newsroom**! Desk-Top publishing, here we come!

5. **Bodyman I** $40: Organ Anatomy for learners. Soon to be followed by II (bare bones/muscles) & III ("tasteful"!? reproduction).

6. **Canon PJ-1080** $700: Best silent streaming 7-color ink-jet yet.

B. Fast Flops (MIA's)

1. **CBS** software (some bargains being cut loose, shop selectively).

2. **Cardco's C-64 Digitizer?** Rumored to be down and out. Too bad. It really did a fast 5-scale gray capture (3-sec), compared to good-ol' slow-scan ComputerEyes.

3. **Trivia Fever** $7: like Halley's Comet (and Michael Jackson), meteoric, only to be seen on a very clear night, and then with binocs!

Questions?: Why no mention of WOC-III in the Dec. issues of Commodore Microcomputers, the Gazette, and Run? Only Ahoy (Dec.) and Power Play (Jan.) gave it minimum notice. How come nobody in the US Commodore Amiga marketing dept., run by V.P. Frank Leonardi, could offer information regarding the show one week before its start? Isn't it time to get Canada and the US together? Is this a Global Village or a "Gobble Village?" Didn't Commodore lose $47 million in the last quarter? Are we all *turkeys* looking forward to **Thanksgiving?** ●

ATARI

Applying The Atari

by Jeff Brenner

Puzzle Generator, Digitized Picture

This month's feature program is *PixMix*, a high-resolution puzzle generator. Not only is this an excellent way to show off your Atari's graphics capabilities, but it's real entertaining and challenging as well. And to test it out, we'll type in data for a digitized picture.

The 520ST

Apparently Jack Tramiel has the right touch. Atari says that by the end of 1985 it had shipped about 100,000 ST units, though many of these were to Europe. And Atari has had continued success with the 800XL and the newer 130XE. Many distributors have been selling the 130XE in a package with the 1050 disk drive, 1027 letter-quality printer and *AtariWriter Plus* for an incredible $400. Indeed, 1986 looks like a very promising year for the new Atari.

Incidentally, out editor, Stan Veit, has told me that *Computer Shopper* plans to cover the 520ST in a separate column. Therefore, my "Applying The Atari" column will remain devoted to the Atari 400/800/XL/XE.

It's Never Too Late For Corrections

Those of you using the February 1985 *Computer Assisted Study* program may still have problems saving and loading question and answer data, depending on what was residing in memory before *Computer Assisted Study* was run. To fix this for good, we can simply force the string memory to clear with the following line:

```
105 A$(1) = CHR$(0):
A$(FM) = CHR$(0):
A$(2) = A$
```

PixMix

Recently, I attended an Atari users group meeting in New York where several members displayed digitized images that they had captured with their Atari computers. A digitized image, for those of you unfamiliar with the term, is created when a signal from a video camera or videotape recorder is converted into numeric data that the computer can store. The computer can then regenerate the video image to the limits of its graphics resolution. A slow-scan device, such as Ditital Visions' "ComputerEyes," is used to convert the video signal into the data that the computer can understand.

The idea of storing realistic images in my Atari was particularly exciting to me, and I set out to design a few routines for processing and modifying captured digital images. One of these routines enabled a block of the screen to be moved to another section of the screen. On one digitized image, I had plenty of on-screer fun rearranging a young woman's eyes and nose. In a few minutes the entire image was hopelessly scrambled and the idea for the *PixMix Puzzle Machine* instantly evolved.

PicMix turns any Graphics 8 format screen (Graphics 9 through 11, or Graphics 15 or "7.5", i.e. MicroPainter screens) into a 30-piece puzzle that you can mix up as much or as little as you like. Use the joystick to move the "pieces" around the screen to reconstruct the original image. Press the space bar when you get stuck and you'll see the completed puzzle for as long as you like. When you think that you've solved the puzzle, hit the START key and hope that you'll get the short, congratulatory tune instead of the low buzz that tells you to look more carefully.

The faster you complete the puzzle, the better your time and the higher your score. *PixMix* is a great solitary game, but since a score is given, as many people as you like can compete against each other.

PixMix is listed under the "PixMix Puzzle Machine" heading and will run on any 8-bit Atari with a minimum of 40K RAM.

Sample Digitized Picture

Before you test out *PixMix*, you might want to type in and run the "Digitized Picture Data" program. This program creates a cassette or diskette file of a digitized picture of a watch. Since a full-resolution digitized Graphics 8 image is about 8K in data alone, we had to halve its vertical resolution so that it could be typed into the computer in a feasible amount of time. The image still looks realistic, though, and takes up the full length of the screen.

Using *PixMix*

When you RUN *PixMix*, the animated title screen will fall into place and the Atari will take a few seconds to set up the data and to load the machine language routines.

You'll be asked if you're using a cassette or diskette (press C or D). If you're using a diskette you'll be asked to enter the file name for the picture you want to load. To load the digitized watch file created with the "Digitized Picture Data" program, type "CLOCK.PIC" and press RETURN. If you want to load a picture from a diskette with several files on it, you can press RETURN to the "LOAD WHAT PICTURE FILE?" You'll then be shown each file on the diskette. To see the next file, press RETURN. To load the file that is displayed, press y.

The screen will remain blank until the picture is fully loaded. The picture will then



Digitized Picture of Watch

appear on the screen along with a flashing cursor. **Photo 1** shows how the full-resolution watch picture looks like when it is loaded into *PixMix*. The light box in the upper left-hand corner of the screen is the cursor. Plug in a joystick and you can move the cursor to any part of the screen. The cursor was designed to be visible yet semi-transparent to the screen underneath, regardless of whether you are using a color or a black and white screen.

By pressing the trigger, you can "pick up" any piece of the picture and move it to wherever you like. Try it: Push the joystick trigger. You'll hear a beep. Now when you move the cursor, the piece of screen that was under the cursor will

continued on page 156

Atari Help

by Jeff Brenner

In January's "Atari Help" column, Andrew Leo Eddings of Alabaster, AL had asked about memory expansion for the Atari 800XL. Since I was not familiar with the latest memory expansions available for the 800XL, I asked those readers who produced or were familiar with 800XL memory expansion to write. This month we will all learn about the latest memory expansion available, thanks to the many readers who responded to *my* call for help.

The treasurer of the Memphis Atari Systems Hobbyists was kind enough to give us a brief history of the recent activity in the 800XL memory expansion area. He writes:

Claus Buchholz published an article in the September 1985 issue of *BYTE* which described the use of 41256 256K-bit dynamic RAMs to expand the 800XL to a full 256K RAM! I built that modification (for under $30.00) as have many others. Unfortunately, it bank selected 32K pages ($0000-$7FFF) unlike both the 130XE and Axlon and Mosaic expansion mods for the older 800, which bank selects 16K. Buchholz's handler was modified by a Compuserve user named John Radigan. Then Tom Harker of ICD got together with Buchholz and developed a *SpartaDOS*-compatible ramdisk handler for the "256K XL." Now single, enhanced and double densities were supported but no existing software existed for this bank select scheme.

Enter ICD and CDY consulting. Harker (ICD) has introduced the "RAMBO XL" mod which, unlike the original Buchholz mod, allows both the 800XL and 1200XL to be expanded to 256K RAM *plus* providing the same 16K ($4000-$7FFF) selection as the 130XE. These mods produced a pseudo 130XE with 256K instead of 128K of banked memory. The ICD unit retails for $49.95 without DRAMS and the CDY upgrade sells for $99.95 with DRAMS (although it too is available without DRAMS for much less).

With the minimal cost of 41256-150ns dynamic RAMs, Atari ought to give serious consideration to producing a "260XE" as both the manufacturing changes would be minimal and now there is little reason for XL owners to buy XEs! The modified XLs are the most powerful 8-bit Ataris in existence! Add two 50k-baud drives (ICD US Doubler or Happy-Modified 1050's) and the Supra Xebic 1410 based controller with a suitable 10MB hard drive and viola! Now what we need is a printer spooler program like that just released for the 520ST!

Bob Allman
Millington, TN

Thomas Harker, president of ICD (1220 Rock Street, Suite 310, Rockford, IL

continued on page 161

Atari Book Reviews

by Jeff Brenner

Atari XL User's Handbook

Here's the book Atari should have included in the box with the Atari 800XL. The *Atari XL User's Handbook*, (360 pages, Weber Systems, Inc., 8437 Mayfield Road, Cleveland, OH 44026, $15.95), was written by the staff of Weber Systems and covers a wealth of topics ranging from an introduction of bits and bytes, to writing a joystick-controlled game program.

The first two chapters of this book provide an introduction to the XL computers inside and out. The various chips are discussed, including the 6502C microprocessor, Pokey, Antic and GTIA, as well as the keyboard and peripherals such as the 1050 disk drive, printers and modems. An easy to understand section on setting up the XL and connecting the peripherals is the first thing an 800XL owner will want to turn to.

Chapter 3 contains an "Introduction to the Atari BASIC," which is particularly important, since a discussion of Atari BASIC was noticeably lacking from the XL manual included with the computer. The chapter describes error messages, entering and editing a program with the Atari's special editing keys, and running, saving and loading the programs. Additional sections in this chapter cover strings, numeric data, variables, operators and the order of evaluation. The specifics of Atari BASIC are covered in the following two chapters, which focus on the input/output commands, variable arrays, mathematical functions, and file handling. The short sample programs provided are appropriate and demonstrate good applications of the commands being discussed. For example, Chapter 5 concludes with the construction of a simple database program that employs most of the file handling commands discussed previously in the chapter. My only complaint about this section of the book is that the authors should have gone into more detail on the peculiarities of the Atari's string handling, particularly in comparison to the string handling of Microsoft BASIC.

The graphics and sound of the Atari Xl are introduced in Chapter 6. This is really the

continued on page 160

Atari Introduces 1040ST Sends 520ST To Chains



New Atari 1040ST Computer

Atari is now selling their new successful high performance personal computer, the 520ST, to mass market stores. Simultaneously, the company is introducing an even more powerful computer, the 1040ST (1024K), for exclusive distribution by computer specialty dealers.

In addition to the 520ST and over 150 ST software programs, Atari is showing several other new products, including a 130XE bundle consisting of the powerful 128K personal computer with mouse, printer, disk drive and five software titles, Silent Butler, Star Raiders, Music Painter, Paint, and AtariWriter, a word processing program--all for an expected retail price of $399.

According to Atari president Sam Tramiel, "With the introduction at CES of exciting new products and programs, we are announcing that this is the 'new' Atari, a revitalized company with a clear claim to several market segments. We're the fastest-growing manufacturer of popularly-priced computers and the leading manufacturer of video games."

Consumer demand for the 520ST convinced Atari that the machine was suited for broad distribution channels. Atari executive vice president Michael V. Katz explained, "The 520ST is aimed at the computer user who wants to trade up to a 16-bit system. We think the 520ST is the right machine at the right price for this user."

Distinguished from its original design, the 520ST will have a built-in RF modulator; the basic unit will retail for under $400. A bundled system comes complete with a 3.5-inch disk drive, mouse, black-and-white monitor and four software packages for under $700 and with color monitor for under $900.

A growing software library is available for the ST computers, with 150 titles now in stores, and a minimum of 100 additional programs scheduled for release in the first quarter of the year. Over 1500 developers worldwide are doing development work on the ST computers, including such leading American companies as Spinnaker, Sierra On-Line and Activision.

Atari dealers are less enthusiastic about the announcement. One very active dealer said "This is the same Tramiel tactic used at Commodore, I am sick of doing his pioneering work only to have KMart reap the profit." Dealers feel that the existence of a cheap 520ST will dilute their sales. ●

Computereyes Graphics 9 Mode Compatibility For Atari Computer

Digital Vision, Inc., announces the availability of Graphics 9 Mode Compatibility Software to further enhance the performance and compatibility of its popular Computereyes Video Acquisition System. Computereyes is the company's innovative slow-scan device that connects between any standard video source (video camera, videotape recorder, video disk, etc.) and the computer allows the user to acquire images into the high-res memory of the computer. Under simple software control the user can acquire images in either the Atari Graphics 8 mode (highest resolution), or Graphics 7.5 mode (graphics tablet compatible) and now in the Graphics 9 mode.

In the Atari Graphics 9 mode, resolution is sacrificed for the ability to display 16 shades of true grey. COMPUTER EYES images acquired in this mode are superb! (See screen photo of Graphics 9 mode acquired image). The Computereyes Graphics 9 Mode Compatibility Software includes all of the image capture routines and features of the standard software including save-to-disk capabilities so that the images may be loaded into other popular image manipulating and printing programs. The enhancement includes disk and users manual and is available for a nominal fee.

Computereyes is available for Atari 800/800XL/130XE computers, Commodore 64/128 computers, and the Apple II+, IIe, and IIc series computers. Versions for the Atari ST and IBM PC will be available in the early part of 1986.

For further information, review systems, photos, etc. pleast contact: Digital Vision, Inc., 14 Oak Street - Suite 2, Needham, MA 02192, 617-444-9040, 449-7160

Mention that you read about it in *Computer Shopper*. ●



ATARI ST

Atari 520ST Double Sided Boot Disks

by Bruce Laubenheimer Jr.

The Atari 520ST is shipped from the factory with a single sided (360K) boot disk. While this is not a problem for most users, it was for myself. One of the first equipment changes I made was to sell my single sided drive and purchase two of the SF314 double sided drives when they became available in August. Purchasing one of the double sided drives would have helped the situation to some extent; but, switching to identical drives prevented segmentation of my library in to both double sided and single sided formats. This change also allowed placement of the complete ALCYON compiler, linker and Micro EMACS on one disk with drive "B" used as a data disk for all of the temporary files. The only problem remaining was that the system boot code took up almost all of a single sided disk with the desk accessories and the TOS files. A double sided boot disk allows you to place most of the files used on a normal basis on one disk and lessens the possibility that the boot disk would have to be removed from Drive "A" each time the system was booted up.

Generally a copy of a boot disk is made by using a sector copy. This is accomplished on the ST by selecting and dragging the source drive icon, to the destination drive icon. Sector copying may only be used if the source and destination drives are of the same configuration. Copying from single to double, double to single, or physical drive to RAM disk is not allowed in sector by sector mode. The exchange information between drives or disks of differing format requires the use of a file by file copying procedure. The obvious constraint to using this method is that the information must be in "file" form, and it must be in the disk directory. The boot sector may only be copied with sector copying, therefore a program had to be written allowing the transferrence of a single sided boot sector to a double sided disk.

The first step was to write a C program that would copy just the boot sector from one disk to another. As insignificant as this may seem, it allows new single sided boot disks to be made without the fragmentation that occurs when a disk has had a number of files written to, and deleted from it. Generation of a "disk full" error code on a write operation, when the disk directory indicated that there was enough room for the new file, normally indicates some degree of fragmentation. Sector copying the whole disk will reproduce the data as well as the fragmentation. To make a clean boot disk, copy just the boot sector to the new disk, and use file by file copying for the rest of the information.

There are a few words of caution before the program discussion starts. These programs are not error trapped. Any major problems should be caught by the TOS low level routines, but there are no guarantees that those routines will prevent destruction of important data on the destination disk. These programs were written in a "quick and dirty" manner; obviously they are not as polished as commercial programs. I make no apologies for the lack of error trapping. When TOS becomes available on ROM there will be no need for a boot disk, and these programs are intended as an interim solution. If you do not feel confident in the use of these programs, do not use them without proper precautions. Those precautions being, write protect your source disk, format your destination disk before starting, and make sure you write the proper type of boot sector to the disk.

What could go wrong? Writing a single sided boot sector to a single sided disk probably will not do any damage. Writing a single sided boot sector to a double sided disk will convert the new disk to single sided. If you do that to a double sided disk that already contains files, it will hopelessly scramble the directory as well as the files on the disk.

For the following discussion, refer to program listing number one. The first seven lines comprise a header, constructed from comment lines. This is used mainly as an indexing aid for storage of source code. The program actually begins with the #include statements. These statements instruct the C language preprocessor to include those header files with the source code while the program is being compiled.

The next statements are the variable declarations, which are a required part of the C language. The first batch of variables are declared to be integer, and are well documented as to usage in the source code. However, some of the choices for these variables do require some further explanation. The "disktype" variable:

continued on page 66

```
/*****************************************/
/*                                       */
/*    SS/DD  Disk boot sector generator  */
/*                                       */
/*   by Bruce Laubenheimer Jr.  11/26/85 */
/*                                       */
/*****************************************/

#include <osbind.h>
#include <stdio.h>

int  i, offset,
     disktype = 2,          /*  80 tracks single sided          */
     execflag = 1,          /*  Make the boot sector executable */
     devno    = 0,          /*  Operations on the "A" disk drive */
     sectno   = 1,          /*  Sector number to write to       */
     trackn   = 0,          /*  Track number to write to        */
     sideno   = 0,          /*  Side number to write to         */
     count    = 1;          /*  Number of sectors to write      */

long int filler,
       serialno = 0x1000000; /* Generate a random serial number */

/*  Apparently the Protobt function call likes new serial numbers */

char  buffer[ 0x200 ];

intro()
   {
    printf("¦================================================¦\n");
    printf("¦                                                ¦\n");
    printf("¦  Boot sector generator for single sided disks  ¦\n");
    printf("¦                                                ¦\n");
    printf("¦         by Bruce Laubenheimer Jr.  11/26/85    ¦\n");
    printf("¦                                                ¦\n");
    printf("¦================================================¦\n");
    printf("\n\n\n");
   }

wait_key()
   {
    printf("\n*** Hit any key to continue ***\n\n");
    Bconin(2);
   }

read_boot_sector()
   {
    printf("Place a write protected system boot disk in drive A\n");

    wait_key();

    printf("*** Reading boot sector into memory ***\n\n");

    Floprd( &buffer, filler, devno, sectno, trackno, sideno, count);
   }

write_boot_sector()
   {
    printf("Please place a formatted single sided disk that you wish to\n");
    printf("have a boot sector written on, in drive A.  ( non-protected )\n");

    wait_key();

    Flopwr( &buffer, filler, devno, sectno, trackno, sideno, count);

    printf("*** Boot sector sucessfully written to new disk ***\n");
   }

main()
   {
    intro();

    read_boot_sector();

    Protobt( &buffer, serialno, disktype, execflag );

    write_boot_sector();

    wait_key();
```

Free Software For The Atari 520ST

by W. Rostek

Like all new machines, the Atari ST has been hampered by a lack of software. It's the standard Catch-22 of the micro computer industry. Computers are hard to sell without software, and you can't sell software unless there are a lot of computers in the hands of customers. Early Macintosh and IBM PC users are sure to remember the long wait between getting their computers and having the software selection that they now enjoy.

ST owners are now experiencing the same frustration, but it will be for a much shorter time. Software is showing up for the STs faster than it has for any previous micro. This reflects the maturing of the personal computer industry. And the faith many software developers have in the future of the ST line.

While the majority of new and upcoming ST programs are destined for your local computer stores' shelves. There is already a respectable amount of public domain software. Yes, that's right, FREE programs. The number and quality of these programs is amazing, especially on a system as new as the Atari 520ST. Three of the PD programs really stands out in the crowd and would be a welcome addition to any software collection. Free or not, ST Writer, NEOchrome, and Megariods are good programs.

As the name implies ST Writer is a word processing program for the ST. What is surprising is that ST Writer is an updated version of Atari Writer. Atari Writer, as many of you know, is one of the most popular word processing programs for the 8-bit Atari systems. The ST version has all the features of its predecessor with a few enhancements. Not the least being the STs 80 column display. A vast improvement over the 40 columns that the older machines have.

The program starts by presenting you with a menu of more or less standard word processing options. Such as Create File, Delete File, Edit File, Load File, Print File, Save File, Index of Files, and Quit. All normal and fairly obvious commands.

But added to these are a few different ones. Format Disk, which is a very nice option allows you to format a blank disk without exiting the program. This can come in very handy if you have spent a long time creating a file and then realize that you didn't have a formatted disk to save it to, or are out of room on your working disk. Granted this shouldn't happen if you think ahead but it's nice to have just the same.

HIRES Flip-Flop, switches the Hi res. display between 22 lines and 37 lines. This allows users with the monochrome

continued on page 66

Atari 520ST
continued from page 65

-1 = Leave the existing disk type information alone.
0 = 40 tracks single sided (IBM 180K)
1 = 40 tracks double sided (IBM 360K)
2 = 80 tracks single sided (ATARI SF354 360K)
3 = 80 tracks double sided (ATARI SF314 720K)

The "execflag" variable:

-1 = Leave the existing execute flag alone.
0 = Non executable boot sector.
1 = Executable boot sector.

The "devno" variable, 0 = Drive A, 1 = Drive B.

The next declarations in this program are for long integer type variables. The "filler" variable is just an unused long word in both the sector read and sector write XBIOS function calls. The "serialno" variable is set to a hex value of one million, this forces the boot sector protyping function call to generate a new 24 bit random serial number. If "serialno" is set to a value of -1, the documentation states that the existing disk serial number will not be changed. So far, the only way to reliably create boot sectors is to allow the protyping function to generate a new serial number each time.

The char declaration allocates a character array named buffer to $200 to 512 bytes, which is the size of one sector. This is the area that the boot sector information will be stored.

The "intro" function just prints a display on the screen as a reminder of which program is currently running. The "waitkey" function uses a BIOS function call to await a keypress at the console. One note: in the ATARI ST BASIC sourcebook, the keyboard is listed as device 4 for both the INP and OUT commands. Use device 2 (the console) to get keystrokes, device 4 is the intelligent keyboard controller.

The "readbootsector" function reads a boot sector from a single sided disk and stores it in the character array named buffer. The "protobt" or prototype boot function in the main function of this program manipulates specific bytes of the boot sector allowing it to become executable. The actual boot code is not changed, the only things that are changed in this case are the disk serial number in the sector header, and the checksum word at location $1FE in the first sector. For a boot sector to be executable, it must checksum to the magic vale of $1234. The 'writebootsector" function takes the new boot sector that has been prototyped in memory and writes it to a single sided disk.

To use this program, compile and link with the Alcyon C package and rename the file to BOOT1S.TOS. Format a single sided disk before you run the program. When the program is run, you will be prompted to insert your boot disk into drive A. Once that is completed, press any key and the boot sector will be read into memory. The program will prompt you to insert a formatted disk into drive A, press any key and the boot sector will be written to the new disk. The program should print a successful completion message and after another keystroke, it will return you to the GEM desktop. At that time, drag the TOS.IMG file by itself to the new disk, and then any other files that you wish to have on the disk. This procedure assures that the TOS.IMG file is the first one on the disk and is the configuration which gives the fastest system boot up time.

Now look at table number 1. This is an overview of the space allocation and the defaults that are found in a standard 520ST boot sector. You will notice that the only things that are different between single and double sided disks are: the total number of bytes per disk, the media descriptor, and the number of sides on the media. Although, the media descriptor byte is documented as being unused, it is not the same on each type of disk.

Program listing number 2 is the logical extension of program 1. The additional code declares three static character arrays and a new function named "setdouble." The purpose of this code is to define the new double sided disk parameters, and then write them into the appropriate locations of the prototyping buffer. The "protobt" function call then generates a new random 24 bit serial number, computes the sector checksum and adjusts the checksum word at locations $1FE. The new sector will now checksum to the magic value of $1234 and will be executable.

Compile and link as was done with program 1. Rename the file to BOOT2S.TOS. Before the program is run, format a double sided disk. This program runs as did the first one, except you will be prompted to insert a double sided disk on which the boot sector is to be written. Good luck. The programs do work and as a side benefit, the double sided boot disks boot up considerably faster than a single sided boot disk. This is mainly due to a reduction in disk access times directly related to the disk drive stepper motor response time.

The executable form of these programs as well as the C source code is available from the National ST Users Group, 3650 Sand Court, Mims, FL 32754; BBS number (305) 383-1413. ●

```
/*****************************************/
/*                                       */
/*    DS/DD  Disk boot sector generator  */
/*                                       */
/*    by Bruce Laubenheimer Jr.  11/27/85  */
/*                                       */
/*****************************************/
#include <osbind.h>
#include <stdio.h>
int  i, offset,
     disktype = 3,          /*  80 tracks double sided          */
     execflag = 1,          /*  Make the boot sector executable  */
     devno    = 0,          /*  Operations on the "A" disk drive */
     sectno   = 1,          /*  Sector number to write to        */
     trackno  = 0,          /*  Track number to write to         */
     sideno   = 0,          /*  Side number to write to          */
     count    = 1;          /*  Number of sectors to write       */

long int filler,
        serialno = 0x1000000; /* Generate a random serial number */

/*  Apparently the Protobt function call likes new serial numbers */

char  buffer[ 0x200 ];
/* Set up defaults for prototypical double sided boot sector   */

/* Two byte character arrays are in low byte / high byte order */

static char  sectors[ 2 ] = { 0xA0, 0x05 };   /*  1040 double sided sectors  */

static char    media[ 1 ] = { 0xF9 };         /*  Unused? single sided is F8 */

static char    sides[ 2 ] = { 0x02, 0x00 };   /*  Double sided media         */

set_double()                /*  Place the new sector parameters in the buffer  */
   {
    buffer[ 0x13 ] = sectors[ 0 ];
    buffer[ 0x14 ] = sectors[ 1 ];

    buffer[ 0x15 ] = media[ 0 ];

    buffer[ 0x1A ] = sides[ 0 ];
    buffer[ 0x1B ] = sides[ 1 ];
   }
intro()
   {
    printf("\n=============================================\n");
    printf("|                                           |\n");
    printf("|  Boot sector generator for double sided disks  |\n");
    printf("|                                           |\n");
    printf("|         by Bruce Laubenheimer Jr.  11/27/85     |\n");
    printf("|                                           |\n");
    printf("=============================================\n");
    printf("\n\n\n");
   }
wait_key()
   {
    printf("\n*** Hit any key to continue ***\n\n");
    Bconin(2);
   }
read_boot_sector()
   {
    printf("Place a write protected system boot disk in drive A\n");

    wait_key();

    printf("*** Reading boot sector into memory ***\n\n");

    Floprd( &buffer, filler, devno, sectno, trackno, sideno, count);
   }
write_boot_sector()
   {
    printf("Please place a formatted double sided disk that you wish to\n");
    printf("have a boot sector written on, in drive A. ( non-protected )\n\r");

    wait_key();

    Flopwr( &buffer, filler, devno, sectno, trackno, sideno, count);

    printf("*** Boot sector sucessfully written to new disk ***\n");
   }

main()
   {
    intro();

    read_boot_sector();

    set_double();

    Protobt( &buffer, serialno, disktype, execflag );

    write_boot_sector();

    wait_key();
   }
```

Table 1 ATARI 520ST Boot sector usage and defaults

Bytes	Nomenclature	SS	DS
$00 & $01	Branch to boot code	$60,$38	Same
$02 - $07	Loader reserved bytes	"Loader"	Same
$08 - $0A	Volume serial number	Unique	Same
$0B & $0C	Bytes per sector (512)	$00,$02	Same
$0D	Sectors per cluster	$02	Same
$0E & $0F	Reserved sectors	$01,$00	Same
$10	Number of FATS	$02	Same
$11 & $12	Directory entries	$70,$00	Same
$13 & $14	Total sectors on media	$D0,$02	$A0,$05
$15	Media type (unused)	$F8	$F9
$16 & $17	Sectors per FAT	$05,$00	Same
$18 & $19	Sectors per track	$09,$00	Same
$1A & $1B	Sides on media	$01,$00	$02,$00
$1C & $1D	Hidden sectors (unused)	$00,$00	Same
$1E - $1FD	Reserved for boot code	NA	Same
$1FE - $1FF	Checksum word	See text	Same

Note: all values are in Low byte / High byte order

Free Software
continued from page 65

monitor to get more text on the screen. People with color monitors have to stay with the 22 line screen.

Transform colors reverse screen colors black to white and vice-versa. This allows the user to pick which he or she prefers, white letters on a black screen or black on white. Those with color monitors can also preset the text and background colors before starting an editing session. The nice thing about the ability to flip-flop the background and text colors is that it helps to relieve eye strain during long editing sessions. It's amazing how a little thing like this can make a program so much nicer to use.

The last menu option shows that Atari hasn't forgotten the 8-bit Atari users who are moving into the 16-bit systems. This is Receive file from 850. Which allows people with a lot of Atari Writer files on their old system a simple method of transferring them to their STs. They even tell you how to construct the necessary cable in the ST Writer documentation.

The editing features of the program are powerful and easy to use. Block moves, deletes, search, search and replace (with or without Query), underlining, subscripts, and superscripts. All are done with just a few keystrokes.

The only main feature missing is the availability to work on two or more documents simultaneously, via multiple editing windows. You can merge files together, then use the block moves and block deletes to do the same thing, but it's not as convenient. Also lacking is a good mail-merge system. They do provide a way to do it but it's clumsy and not one of the strong points of the program.

Also lacking are any of the advanced GEM features available on the ST. No drop-down menus or any other form of on screen help. All on screen text is displayed in the default text font, and no on screen boldface or underline.

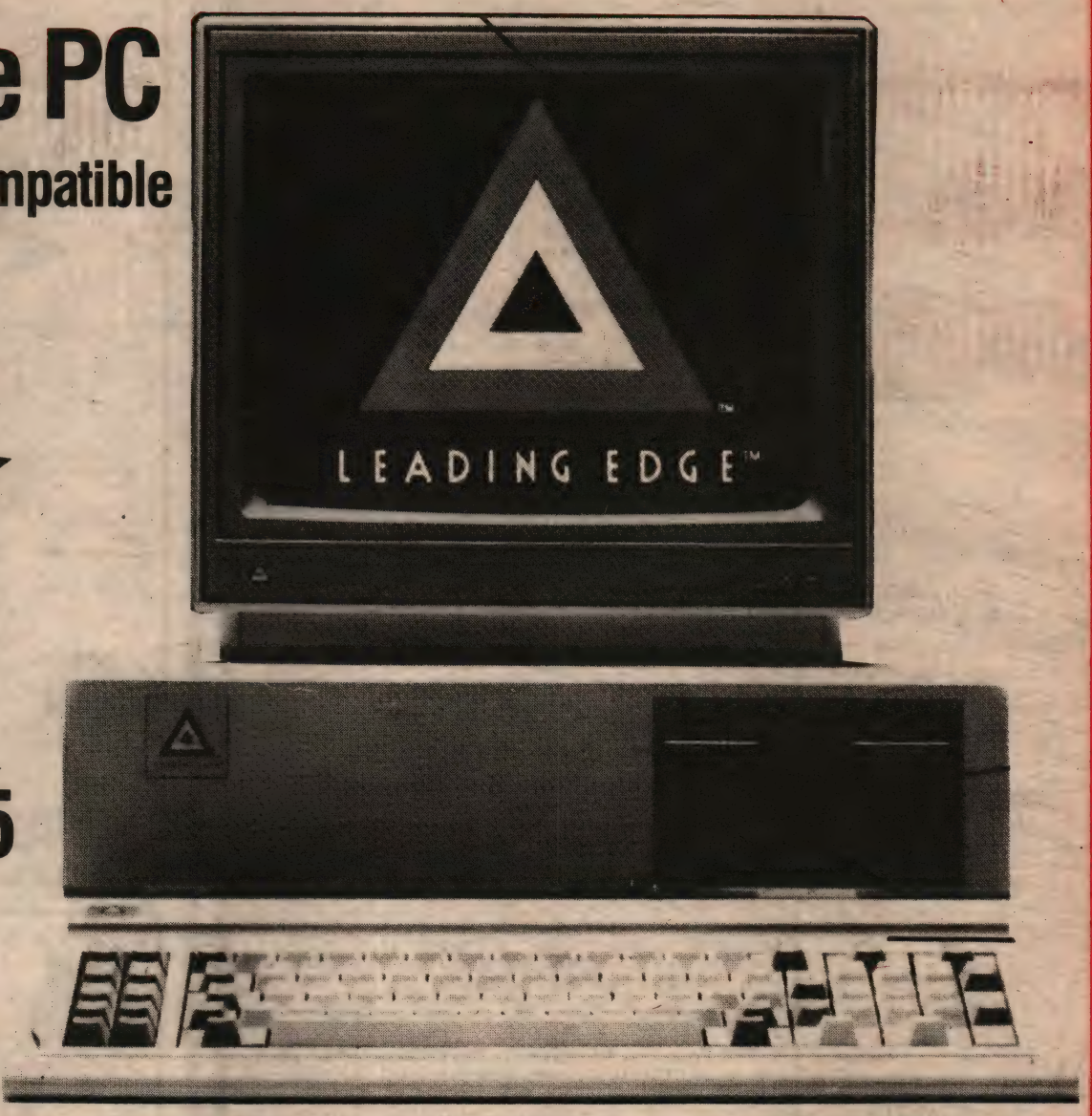
Where ST Writer does shine is in it's text formatting and printing capabilities. Just about any formatting commands you may need are available. Including many commands to take advantage of your dot matrix printer's ability to print different fonts. The print options allow easily controlled printer operation. The ability to print to the screen to preview your work before committing it to paper. You can also print your work to a disk file. Perfect for creating on

continued on page 167

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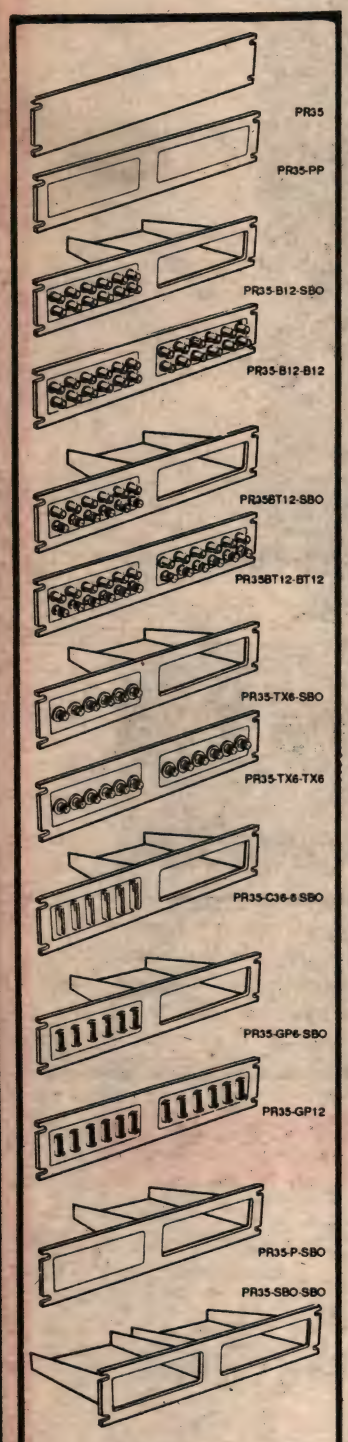
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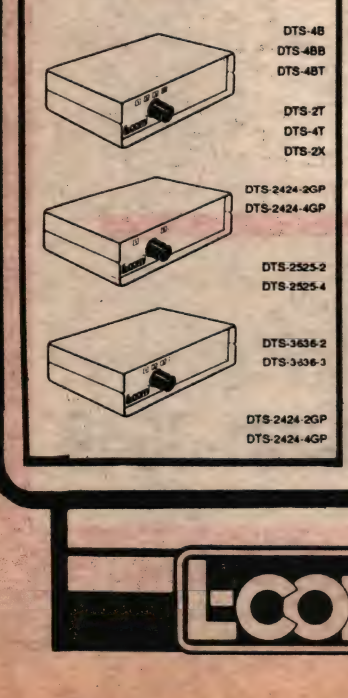
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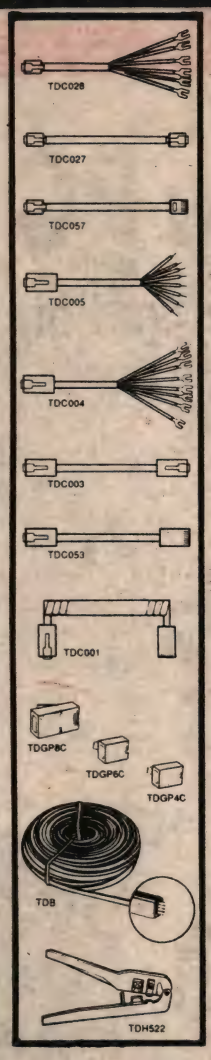


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	One Set of 6 BNC / TNC Prs. & SW. Box Opening Use with DTS4BT BNC / TNC Transfer Switch Boxes listed. below.	113.10
	Two Sets of 6 BNC / TNC Bulkhead Adaptor Pairs.	190.70
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	Two Sets of 6 Twinaxial Bulkhead Adaptors	266.90
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With GPIB (IEEE-488) Bulkhead Adaptors		
	6 GPIB Feed-Thru Adaptors & Sw Box Opening Use with any DTS-2424 GPIB Switch Boxes listed below.	158.50
	12 GPIB Feed-Thru Bulkhead Adaptors	284.50
Panels - Accept One or Two Switch Boxes		
	Blank, 2" x 7" Insul, Panel & Sw Box Opening Use with any DTS Series Transfer Switch Boxes listed below.	29.50
	Panel with Two Switch Box Openings Use with any two DTS Series Transfer Switch Boxes listed below. A new complete line is available from L-COM. Ask for details or quotation.	35.50



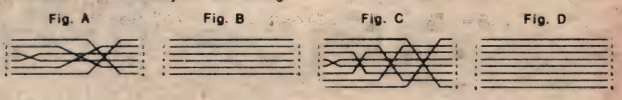
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SWITCH BOXES - Mate any "SBO" Openings		
	BNC: Switch up to 4 compatable devices to a 5th	89.00
	DUAL BNC: Switch up 4 Prs. of compatables to a 5th	129.00
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	Twinax: Switch 2 compatable devices to a 3rd	99.00
	Twinax: Switch 4 compatable devices to a 5th	169.00
	Crossover, to reverse compatable devices	149.00
	GPIB: Switch 2 compatable devices to a 3rd	145.00
	GPIB: Switch 4 compatable devices to a 5th Fully shielded to meet IEEE-488 requirements	195.00
	RS232: Switch 2 compatable devices to a 3rd	115.00
	RS232: Switch 4 compatable devices to a 5th All 25 lines switched - Ask for literature on our full line.	165.00
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	Centronics: Switch 3 compatable devices to a 4th All 36 lines switched - Ask for literature on our full line.	195.00
	GPIB: Switch 2 compatable devices to a 3rd	145.00
	GPIB: Switch 4 compatable devices to a 5th All 24 lines switched - Ask for literature on our full line.	195.00

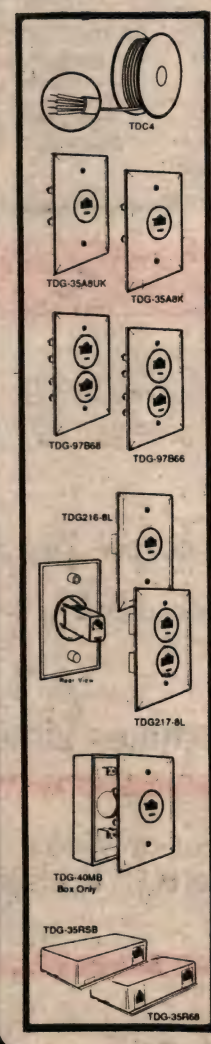
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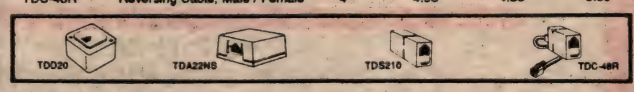
MODEL	DESCRIPTION	LGT / FT	# WIRES	1-9	10-24	25-99
6 Conductor Modular Cords - Spade Lug Termination						
TDC028-7	Termination	7	6	2.55	2.24	1.99
TDC028-14	Termination	14	6	3.45	3.04	2.69
6 Conductor Modular Cords - Crossed Pinning, End to End (See Fig. A)						
TDC027-7	Extension	7	6	2.95	2.60	2.30
TDC027-14	Extension	14	6	3.85	3.39	3.00
TDC027-25	Extension	25	6	4.95	4.36	3.86
6 Conductor Modular Cords - Straight-Thru Pinning, End to End (See Fig. B)						
TDC057-7	Extension	7	6	2.95	2.60	2.30
TDC057-14	Extension	14	6	3.85	3.39	3.00
TDC057-25	Extension	25	6	4.95	4.36	3.86
8 Conductor Modular Cords - Tinned Solder Termination						
TDC005-2	Termination	2	8	2.25	1.98	1.76
TDC005-7	Termination	7	8	2.95	2.60	2.30
TDC005-14	Termination	14	8	3.95	3.48	3.08
8 Conductor Modular Cords - Spade Lug Termination						
TDC004-2	Termination	2	8	2.25	1.98	1.76
TDC004-7	Termination	7	8	2.95	2.60	2.30
TDC004-14	Termination	14	8	3.95	3.48	3.08
8 Conductor Modular Cords - Crossed Pinning, End to End (See Fig. C)						
TDC003-2	Extension	2	8	2.95	2.60	2.30
TDC003-7	Extension	7	8	3.55	3.12	2.77
TDC003-14	Extension	14	8	4.85	4.27	3.78
TDC003-25	Extension	25	8	6.95	6.12	5.42
8 Conductor Modular Cords - Straight-Thru Pinning, End to End (See Fig. D)						
TDC053-2	Extension	2	8	2.95	2.60	2.30
TDC053-7	Extension	7	8	3.55	3.12	2.77
TDC053-14	Extension	14	8	4.85	4.27	3.78
TDC053-25	Extension	25	8	6.95	6.12	5.42
8 Conductor Modular Coiled Cords - Straight-Thru Pinning (See Fig. D)						
TDC001-6	Extension	6	8	3.95	3.48	3.08
TDC001-8	Extension	8	8	4.55	4.00	3.55
TDC001-10	Extension	10	8	4.95	4.36	3.86
Modular Plugs - Clear Plastic & Gold Plated Contacts, 100 Per Pac						
TDGP4C	Modular Plug		4	25.50	22.44	19.89
TDGP6C	Modular Plug		6	38.00	33.44	29.64
TDGP8C	Modular Plug		8	48.00	42.24	37.44
TDGP8K	Modular Plug, with Key		8	48.00	42.24	37.44
	NOTICE: Plugs sold in minimum & multiples of 100					
Modular Cord - Flat Silver Color, For use with Above Plugs						
TDB4-100	Modular Cord (PVC), 100 ft.		4	6.50	5.72	5.07
TDB6-100	Modular Cord (PVC), 100 ft.		6	12.50	11.00	9.75
TDB8-100	Modular Cord (PVC), 100 ft.		8	17.50	15.40	13.65
Crimping Tool - Strips & Crimps to Assemble Your Own Cables						
TDH522C	Economy Tool for P4C Plugs			6.95	6.12	5.42
TDH522D	Economy Tool for P6C Plugs			7.95	7.00	6.20
TDH522E	Economy Tool for P8C Plugs			12.95	11.40	10.10

Fig. A Fig. B Fig. C Fig. D





MODEL	DESCRIPTION	LGT / FT	# WIRES	1-9	10-24	25-99
Hook-Up Cable - Round, Neutral Tan, Solid AWG-26 Copper Wires						
TDC4-25	Inside Cable	25	4	1.95	1.72	1.52
TDC4-50	Inside Cable	50	4	3.90	3.43	3.04
TDC4-100	Inside Cable	100	4	7.55	6.64	5.89
TDC6-25	Inside Cable	25	6	2.95	2.60	2.30
TDC6-50	Inside Cable	50	6	5.90	5.19	4.60
TDC6-100	Inside Cable	100	6	11.95	10.52	9.32
TDC8-25	Inside Cable	25	8	4.50	3.96	3.51
TDC8-50	Inside Cable	50	8	8.95	7.88	6.98
TDC8-100	Inside Cable	100	8	17.85	15.71	13.92
Hook-Up Cable - Round, Neutral Tan, Solid AWG-24 Copper Wires						
TDD4-100	Inside Cable	100	4	8.95	7.88	6.98
TDD4-250	Inside Cable	250	4	21.45	18.88	16.73
TDD6-100	Inside Cable	100	6	13.95	12.28	10.88
TDD6-250	Inside Cable	250	6	33.45	29.44	26.09
TDD8-100	Inside Cable	100	8	19.95	17.56	15.56
TDD8-250	Inside Cable	250	8	46.95	41.32	36.62
Plastic Wall Plates - Ivory with Single Modular Jack & Screw Terminals						
TDG-35A8UK	Single Jack, Non Keyed		8	5.85	5.15	4.56
TDG-35A8K	Single Jack, Keyed		8	5.85	5.15	4.56
Plastic Wall Plates - Ivory with Dual Modular Jacks & Screw Terminals						
TDG-97B68	Double Jack, Keyed		8 - 8	8.95	7.88	6.98
TDG-97B66	Double Jack, 6 Non Keyed; 8 Keyed		6 - 8	8.95	7.88	6.98
Plastic Wall Plates - Ivory with Single or Dual Modular Couplers						
TDG216-8L	Single Jack, Non Keyed		8	8.95	7.88	6.98
TDG217-8L	Dual Jack, Non Keyed		8 - 8	12.95	11.40	10.10
Surface Mounting Box - Accepts Standard Wall Plates as Listed above, 1" deep						
TDG-40MB	Universal Surface Mounting, Single Gang			2.75	2.42	2.15
Junction Boxes - A Convenient means of wiring, Surface Mtd. & Screw Terminals						
TDG-35RSB	Single Jack, Keyed		8	5.95	5.24	4.64
TDG-35R68	Dual Jack, 6 Non-Keyed; 8 keyed		6 - 8	9.45	8.32	7.37
Junction Box Wall Mounted - With one Modular Jack & Screw Terminals						
TDD20	Single Jack, Top Access		4	2.95	2.60	2.30
TDA22NS	Single Jack, Side Access, Keyed		8	4.95	4.36	3.86
Modular Couplers - Mates Two Cables having same Modular Termination						
TDS210-6	Straight Through	see Fig. A	6	3.95	3.48	3.08
TDS210-8	Straight Through	see Fig. C	8	4.95	4.36	3.86
TDS210-6R	Reversed Wiring	see Fig. B	6	3.95	3.48	3.08
TDS210-8R	Reversed Wiring	see Fig. D	8	4.95	4.36	3.86
Modular Adaptor Cable - Reverses Modular Cable wiring when used in series						
TDC-48R	Reversing Cable, Male / Female		4	4.95	4.36	3.86



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The Silver Box

by Richard Fujita

How Good Is A Disk?

Having done some testing of disks in an ordinary environment, I wanted to know which make of disks has more latitude in the bit-density recording capability of the magnetic particles used in the coating. As a second thought this experiment leads to the possibility of putting more sectors on each track, even if the practice deviates from the MSDOS standard. This is important to me because I need more space on the drives.

My exploratory tests showed an excellent possibility of expanding the number of sectors to 13 from 9, i.e. 360K to 520K using 48 tpi drives and 720K to 1040K using 96 tpi drives. The price you have to pay for this increase is: 1) decrease the spindle speed by about 31%, from 300 rpm to 208 rpm, 2) adjust MSDOS disk parameters to accommodate this change, 3) modify the FORMAT.COM, 4) select the brand of disks which permits higher bit-density, or buy HD premium disks.

The preliminary test results are shown in LIST 1. In this test we are testing the upper limit of the bit-density recording capability of some disks. If we disregard the head performance we must accept what is shown in the test data we have. The test was performed using the Toshiba drive and a limited number of disks. Next month I will describe how I carried out the same but more complete test with additional brands of floppy disks on the TEAC 55BV drive.

This TEAC drive uses a ceramic resonator for generating the reference frequency and replacing it with a test frequency source required disassembly of the motor rotor. It was not easy. First of all it uses a special TORX screw like the ones used on the IBM power supplies, on which an ordinary TORX driver will not work. I had to break off the center pin inside the screw head.

One other point of this testing procedure is the S/N, the signal-to-noise ratio, which measures the quality of the playback signal. The data signal voltage generated in the magnetic head decreases by about 31% in direct relationship with the slower speed. The head amplifier has enough gain to compensate for the reduced input signal, but the problem is the noise level. The signal strength decreases in step with the playback noise, but the background noise, induction noise in the magnetic head and the head wiring do not. Noise shielding in some of the drives I tested is poor. Remember, we are handling high frequency signals which extends to the megahertz range. At this frequency range, a short length of unshielded wire can pick up plenty of noise, (especially when it is coiled like a loop antenna).

Testing clearly shows that some brands of double density disks can be used in this medium-density format, which I would like to call MIDD format. For applications requiring the highest reliability, you should use high-density disks which are sometimes called "AT" disks. They should provide you with better data integrity than the AT drives can offer, because you are using them at about 22.5% lower bit-density than in the AT format.

What Is The Disk To Use With The AT?

You can get 1000K storage on the AT floppy drives. If you can install the AT drive in your computer using the MSDOS 3.1, it will solve our immediate problem of storage space impoverishment. But there are some difficulties you have to face. Besides the question of MSDOS 3.1 for the Sanyo computer, I must tell you that the AT format uses a 500KHz bit-stream frequency rather than 250KHz for the normal 5.25" drives. Your FDC requires 2MHz clock instead of the present 1MHz clock. Yes, the RPM and the bit frequency of the AT drives are the same as those for 8" drives!

You may have to switch back and forth between these two clocks if you use both types of formats. This may call for installation of a soft-switch which can be set or reset by the software and partial rewriting of the BIOS if you want to switch the AT drives down to 300 RPM. I've never seen a description of such a switch in the U.S. but I heard from my friends that it is being done in Japan by some crazy hackers. Do you know TEAC even has a model which can handle BOTH normal DSDD disks and the AT disks as well? This model has a motor speed control input on pin 36. I don't know for sure at the time of this writing which Japanese

continued on page 70

Speed Racer: MichTron's Grand Prix

by Dr. Michael W. Ecker

Vroom! Vroom!...VROOM! VROOM!

Not so mature, huh? Okay, I admit it. Speed Racer is one of those games which will make you silly as you act out fantasies of racing in the Grand Prix — or one of three other tracks — on your Sanyo 550/555 series computer. The game is arcade-quality in terms of color and most of the graphics. Some of the displays could be a bit better, perhaps, particularly at $34.95 for the privilege of playing, but read on and I'll tell you more.

As with other MichTron offerings, Speed Racer comes in a colorful box with just a disk and a few pages inside. The disk is well copy-protected. I dislike copy-protected software for the obvious reasons (what if my disk goes bad?, etc.), but this is the kind of product which is the first to get pirated. Having just discovered that some of my own software is presently making the software pirate/fleamarket rounds, I can empathize with the feelings of software publishers who feel they must protect their intellectual property.

As for the instructions, they are meager but more than adequate, as the program is easy to use. All you do is load DOS as usual from your Sanyo MSDOS 2.11 or 1.25 disk, then insert the game disk and type SR. The program loads in several seconds to reveal a screen with directions near the top and most of the graphics of the program itself. I felt that the opening screen was unnecessarily cluttered with "Welcome to Speed Racer" and instructions. Don't misunderstand, it was not really bad, by any means. Its just that I expect a lot from MichTron and the author, Bruce Hansen, and felt they could have just made this a bit cleaner.

A good monochrome monitor, such as my Taxan, or even a medium-resolution RGB color monitor such as my Panasonic 1300, produces attractive results — almost stunning, even. I felt that the one weakness is the track itself. Except for the fastest of the three tracks the motion seemed too artificial to really enjoy the race. I should explain here that the program relies on the illusion of motion a la the arcade game Pole Position. Scenery rushes past and the car really just about stays still. Somehow, it just does not quite come out as well as could be expected, particularly at the lower speeds. My wife confirmed this point without my prompting her when I asked her to play the game.

Here's how this thing works. You pick a track from #1 to #4 via the keys PF1 through PF4, with PF4, the Daytona track, being the hardest. You use the joystick or the arrow keys (I recommend the joystick) to play. You can interrupt the game via the PF1 key, touching any key to resume. PF2 toggles the sound on and off. The sound is a bit primative, but I prefer it on, unless the kids are sleeping and the Sanyo noise box will end that welcome period! To abort a game in progress, use PF10 (that's shift plus PF5). Good idea to use a shift combo for abort, as recovery is not possible.

At the bottom of the screen are summary data and some simulated instrumentation, such as a tachometer, speedometer, lap counter, timer, score, etc., as well as the title of the program and the copyright notice. I think the copyright notice and program name should have been left off once the program began, but that gets back to the clutter issue.

There is one feature not advertised about this game which I did particularly like: bumping. If you bang into another vehicle — something hard not to do, by the way — you will knock it off the road. With classic male aggressiveness, I found myself getting some primitive, visceral enjoyment out of being a road bully and knocking other cars off the road. The penalty for doing so is a loss of speed and a longer time to run the track, but I have to confess that I didn't really care; I liked it!

On the other hand, one programming omission which I did not care for was the fact that if I stopped or slowed down, no car that I had previously passed ever caught up to me. I don't know whether it would have been too much work to program this in, but not to have this struck me as unrealistic. I also noted that Speed Racer does not allow you to go much outside the track, making it impossible to smash into a tree or drive outside the track.

Summary

I like MichTron's products, and although I'm a wee bit disappointed in this one, I can't say that it's not fun. It's just that for $34.95, I expect just a bit more. If you are well-to-do, fine, buy Speed Racer. If you're not in the chips and buy Speed Racer anyway, don't blame me if you're not 100% satisfied, for I'm telling you it as it is. In fairness to MichTron, if you're an arcade games fanatic, you might really love. Decide accordingly for yourself.

MichTron, 576 S. Telegraph, Pontiac, MI 48053. (313) 334-5700. Speed Racer is only for any Sanyo 550 or 555; joystick recommended. $34.95 plus $3 shipping/handling. ●

Reviews Of Newpoker And Solitaire:
A Reviewer's Dream!

by Dr. Michael W. Ecker

I have this recurring fantasy in my role as a reviewer. A manufacturer of software sends me a review copy of a program. The program loads without any special installation (for printers, modems, type of drives, memory, etc.) and indeed, without my even consulting the manual. In fact, in this fantasy, there may not even be a manual! If there is one, it is small.

Upon loading, I run the program and it springs to life with sounds and beautiful colors. Especially the beautiful colors! Even in medium resolution I love them! The program runs flawlessly, is esthestically arranged, and has just the right balance of features and ease of use to make it a joy. To add to my own happiness, I then find that the review is easy to write.

Well, this must be my lucky month, for I have received more than one such program. In this Sanyo article, I look at two such programs made explicitly to take advantage of the features of the Sanyo 550/555. Both are Basic programs, both are stunning in their joy, their graphical presentation, and their value. These two programs are Newpoker, by Kent L. Schepler, and Solitaire, another of the wonderful offerings from MichTron.

Newpoker: An Old Game, But Oh So Beautiful!

This game holds little in the way of novelty, but what it does it does so elegantly that I have to recommend it highly. Plus, an unusual twist, if I understand Ken Schepler correctly: With each mail order sale, a customer gets a free copy of a musical album which is a treasury of old western songs! This is cetainly a novel marketing twist or bonus, but in all honesty, I was not even aware of this until Mr. Schepler pointed this out to me. Fact is, this lagniappe is icing on the cake, and you'll enjoy the program whether you get an album or two or none. Me? I'm no fan of westerns, although I do remember having an almost obsessive fondness for a song which I believe was called "Tombstone Territory" from the television show of the same name, circa 1957 (give or take a year). If anybody knows what I'm referring to, please drop me a note (address at end of article).

But I digress from the review at hand, to which we now return. What is there to Newpoker to recommend it? First, the package is utter simplicity (remember my reviewer fantasy?) combined with all the good work in the programming. You get a single-sided disk with two pages of directions. The directions also appear as a README file on the disk accessible via the TYPE or TYPEF command. The disk contains a few extra files, but the significant one is the Poker game in POKER.BAS. Since Newpoker requires 192K of RAM, Mr. Schepler has provided a RAMTEST.COM program for testing up to eight banks of memory, each 64K, particularly for use if you've just expanded memory to be able to run Newpoker. Another nice extra touch that I'd hardly expect.

Before beginning play, I'd make a backup, or at least copy POKER.BAS to another disk. You won't be able to list the program (thus learning the secrets), nor to save it from Basic — at least not without a little program or utility — so do the copying from DOS.

To play, load DOS. Then use the Newpoker disk or a backup and type POKER, thus loading the batch file with that name. If you wish, you may simply load Basic and POKER.BAS instead in the usual fashions. Now your screen comes to life with color and excitement! If you don't have a color monitor, maybe this is time to reconsider your decision not to get one, provided you can afford one, particularly after buying the recommended memory upgrade. (Just kidding! You can buy memory cheaply right here in the pages of the *Computer Shopper.*)

One of the first things you'll see (after the title) is a payoff board in this betting game. A royal flush pays 1000:1, at one extreme, while a pair is pegged at 2:1. I promptly lost $1000 due to my greed with my escalating bets. I just followed the prompts which told me how to get audio (Control key + A), to change the payoffs (??? Why would I want to do that?), to sort, return to the system, break out to Basic, or to start play.

Right away, the program goes into a display mode, dealing out cards pseudo randomly, evidently always dealing the highest cards first as it deals out left to right. The graphics are attractive, but now it is time to play. I hit the Return key to begin, and Newpoker asks me how many cards I wish to be allowed to draw. I hit the return key again so as to maintain the default of 3. I enter my name when so prompted — in an inspired moment, I used DOC — and now I'm bankrolled up to the house's $1000 limit, so I take the full $1000, or 1000 chips really. I'm dealt five not so exciting cards, and I drop three while keeping a ten and a jack. Hey, the computer now gives me another ten, so now I have a pair, and I get paid two to one on this payoff board. I can now view what I droped (at the end of each hand). Now I opt for the one original feature: double or nothing. I gamble. I say red. It turns out to be...red! I win.

Next hand. And so it goes. At last I decide to quit, cautious about the small winnings after my previous quick loss of $1000 to Newpoker. I exit gracefully via the Q (quit) option and catch an ad for Sounds of the West. I don't mind; it has been a real pleasure to play the enhanced version of Newpoker (new version created the last two months of 1985). Now if only my luck would go as in the second game, not my first one, when I go to Atlantic City...

Summary

There are lots of public domain and inexpensive card game programs floating around. If you already have one, I won't swear that you must run out and buy this one. But if you don't have one already, this one is a lot of fun. A poker game may not seem like much, but a lot of thought and care have gone into producing this one. At $24.95, the price is reasonable. You can order from: Kent L. Schepler, Sounds of the Old West, 3210

continued on page 151

The Silver Box continued from page 69

computer has followed this path, but I am going to investigate and will report it in this column. I guess it could well be the NEC model 9801/VM series.

The VM0 is intended for 8" external drives and comes with no drive. The VM2 has two 1 megabyte drives and NEC advertises that it can read and write 640K disks. This is different from writing on the 48 tpi disk using 36 tpi drives, because their tracks are exactly the same. The only difference is the motor RPM and the signal stream frequency.

More About NEC

The NEC 9801/VM series is a V30 MSDOS machine with two 7220 high-speed graphic controllers in the video display circuit. This is necessary for the Japanese market because all the text has to be generated graphically in the KANJI mode like the MBC-550/555 screens. In this mode each Kanji character displayed on the screen requires 32 bytes minimum in mono and maximum of 72 + 72 + 72 = 216 bytes plus two byte attributes in 24 by 24 dot matrix in color. This is an enormous burden to CPU if it was required to do all this data processing and would have made the computer to perform in snail's pace if screen display is involved. By the way, the resolution of the color screen is 640 x 400 with, I believe, 256 colors.

The NEC V30 is currently in the focus of copyright litigation between NEC and INTEL. It is a high performance 16 bit CPU of CMOS design. The V30 code set includes the complete set of 8086 op-codes. The CPU has a reduced cycle time using the same clock frequency of 4.77mhz although one version can operate at 8mhz. I guess it has a special internal timing controller and for some instruction cycles it switches to a higher clock rate internally. With the aid of an advanced prefetch controller hardware which does in depth anticipation the V30 CPU can handle more code and data at about 10% faster operating speed (according to some reports). There is no reason to limit number of CPUs to perform memory management and prefetch! One other thing not often advertised is that the V30 has a complete 8080 code included in the V30 code set in addition to the 8086 codes. With this CPU you can switch the machine into a genuine CP/M machine mode without the slow software emulator.

For more information about NEC V20/V30, read articles by Ted Drude in the January and February issues of the *Computer Shopper.*

"AT" Versus "MIDD"

The IBM AT uses 360 RPM spindle speed and 500 Mhz bit rate for recording and playback of data. The length of time between the index signal is 20% shorter than in the 300 RPM drive but the higher bit-rate can let you record the data at twice the speed, therefore, you can store 200x300/360 = 167(%) which means 67% more data. The MIDD format can give you 13/9 x 100% = 144.44% of capacity compared to the standard disk at the 208 RPM spindle speed. (This speed is tentative. The real speed will be determined after further experiments next month.) This is the speed adjusted to the best advantage specifically for recording thirteen 512 byte sectors per track using abbreviated IBM 3470 format, rather than at a round number.

Spindle Speed Conversion

If you want to perform the MIDD conversion you must change the spindle speed. This feat can be achieved by two different approaches for the

continued on page 125

LIST 1. USABLE DENSITY TEST OF DISKS AT LOW RPM

TEST 1) FORMATTING TEST AT 175 RPM AND 180 RPM USING TOSHIBA DRIVE BRANDS — Track numbers where formatting operation stopped (in Hex)

	1ST RUN	2ND RUN	3RD RUN	4TH RUN	AT 180RPM
FUJI	23-S1	26-S1	25-S1	24-S1	COMPLETED
KODAK(96)	21-S1	1F-S1	23-S1	25-S1	21-S1
IBM	23-S1	25-S1	COMPLETED	27-S0	COMPLETED
OPUS	22-S0	23-S1	23-S1	COMPLETED	27-S0
PINN.	23-S1	25-S1	23-S1	23-S1	26-S1
3M	COMPLETED	–"–	–"–	–"–	–"–

NOTE: 3M HAS THE BEST RESULTS IN THE ABOVE TEST.

TEST 2) FORMATTING AT 208 RPM

BRAND	1ST RUN	2ND RUN	3RD RUN	4TH RUN	REMARKS
FUJI #1	COMPLETED	–"–	–"–	–"–	
FUJI #2	COMPLETED	–"–	–"–	–"–	
FUJI #3	26-S1	COMPLETED	–"–	–"–	
FUJI #4	26-S1	26-S0	–"–	–"–	
FUJI #5	COMPLETED	–"–	–"–	–"–	
OPUS #1	COMPLETED	–"–	–"–	–"–	
OPUS #2	20-S1	26-S1	26-S1	26-S1	(TRACK 27-S0 BAD)
OPUS #3	25-S1	COMPLETED	–"–	–"–	
OPUS #4	25-S1	COMPLETED	–"–	–"–	
IBM #3	COMPLETED	–"–	–"–	–"–	

NOTES:
1. All track numbers are in Hex. S0 is Side 0, S1 is Side 1. The last track is 27-S1.
2. Tests performed on new disks only.
3. Most diskettes improve after several tries or dry run.
4. No 3M Diskettes tested in Test 2, yet.

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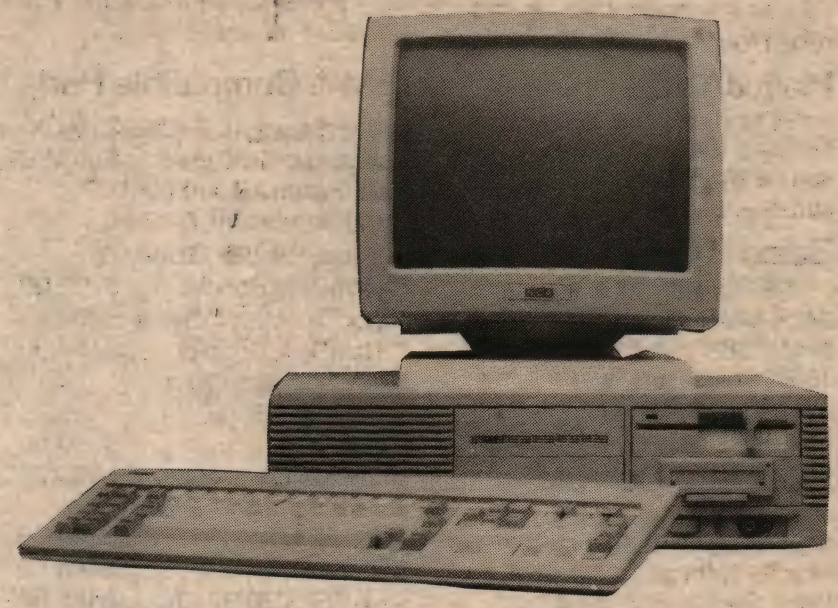
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TANDY COMPUTERS

Toward The Ultimate Communications Program

by Robert K. Fink

A Simple File Transfer Program For The Model IV

I've been using the telephone and modem with my TRS-80s since Model I days. A friend and I continually like to develop the source code for an assembly program together and then share the portions by telephone to speed up the typing job or just help each other learn machine language. I developed a simple disk-to-telephone-to-disk transfer program several years ago and it worked well. When we moved to Model 4s we converted the program for Model III mode and found that we had more numerous transmission "bugs." It could be that the Model IV (really the same old Model III) RS-232 board was not as timing or noise tolerant as the original Model I design. At any rate, once we began to use the Modem program supplied with Montezuma Micro's CP/M with it's error checking, we knew we needed a similar program for Model III mode. While the XMODEM (or Christensen) protocol, as it's called is much slower, it does provide a foolproof way to send any file across the lines. We were also interested in converting some of our Basic programs for use with MBASIC in CP/M. I had used a program called CROSSDOS from 80 Micro (Oct. 1981) to move programs to CP/M with success but a terminal program which would interchange with the CP/M Modem program offers many more advantages. Here's an outline of what our final program does and an assembly listing. It uses DOSPLUS-3.5 so that both Model III mode and Model 4 (TRSDOS or DOSPLUS 4) files can be read in and transmitted. Besides DOSPLUS 3.5 and 2.5K of low memory it requires at least one disk drive.

The program TERMINAL/CMD has accomplished these objectives:

1. Simple Scroll Proof menus on the screen during all phases of operation.
2. Exchange programs without complicated commands or keystrokes to remember.
3. Use XMODEM Protocol so that it is possible to send Basic ASCII files to CP/M for use by MBASIC (or HEX form for machine codes) as well as offering error proof Model III transmission of Model III or 4 programs.
4. Work with any kind of file. (Binary or ASCII).
5. Allow the user to "see" the file blocks on the screen as they go out or come in. This gives the user a reassuring feeling instead of staring for a long period at a blank screen.
6. Offer a transceiver mode so that "Smart Modem" commands can be sent from the keyboard at the start of a session for initial set up. Also allows the program to operate as a simple "communicator" with Bulletin Boards and Services.

There were some features *we did not need:*
Auto Answer or Auto Dialing features, "Switch" setting changes through software during program operation, Line Printer support.

If any of these features are necessary for your use they

continued on page 74

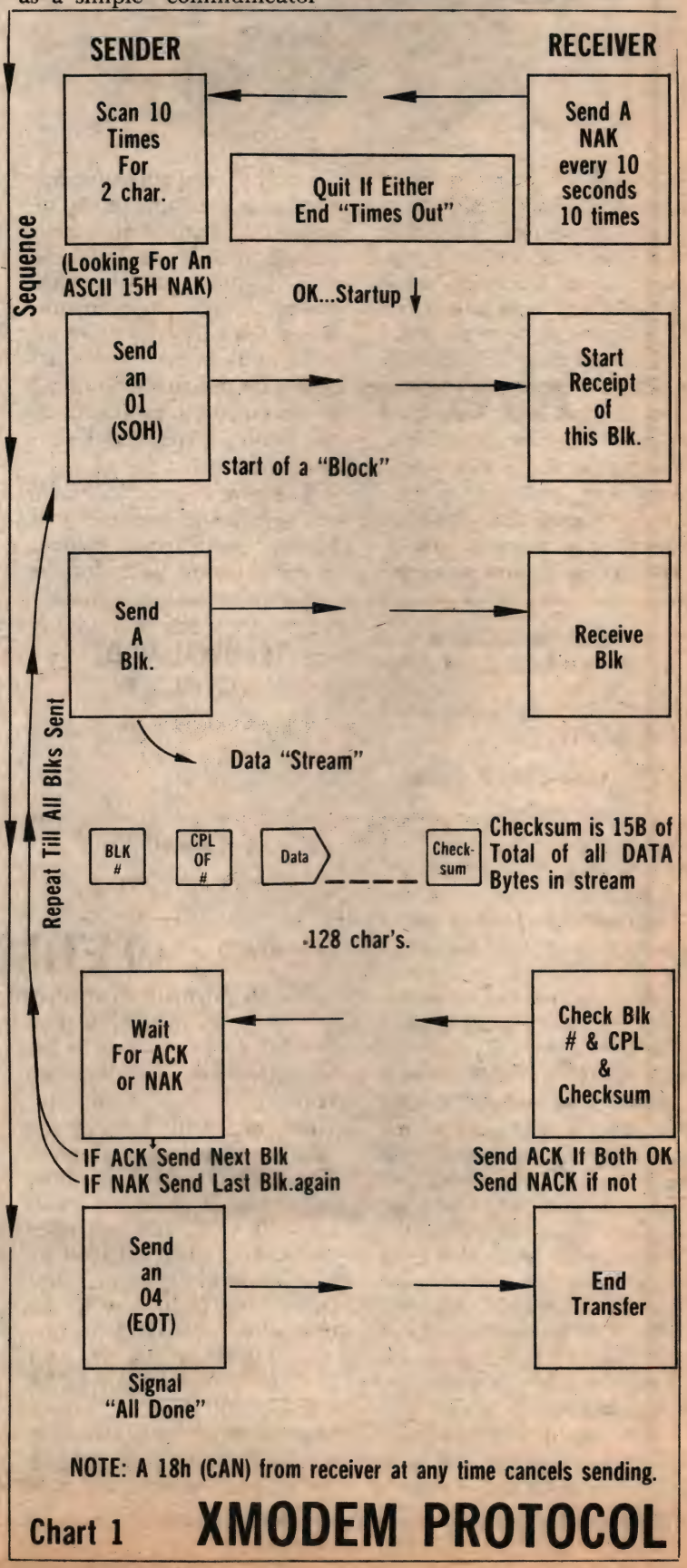


Chart 1 **XMODEM PROTOCOL**

COPYCAT 4.16 For The TRS 80 Model III All 4's

by Lon Andrews

Some time ago I reviewed an older version of COPYCAT for the TRS 80 Models III/4 and I liked it. I did object to the copy protection used by Omnisoft as they probably had the best copy program on the market at the time and it would not copy itself. Someone heard the cry in the wilderness. The new version is not copy protected. Thank you Omnisoft!

If you purchase COPYCAT please don't share it with your friends. Omnisoft has eliminated the copy protection to make our life easier, don't repay them by stealing their profit. In case you are wondering, I bought my copy just like everyone else.

Now down to the bones of the matter. COPYCAT is supplied on a self-booting disk and the program, once booted, is memory resident allowing you the free use of both of your drives. The program is configured for 40 tracks from drive 0 to drive 1 with a stepping rate of 30 milliseconds. If you want to change the configuration simply hit BREAK after the program is loaded.

Once you are in the configuration mode you will be given several options that will require answers in order to reconfigure the program. SOURCE AND DESTINATION DRIVES can be any two drives selected from 0, 1, 2 or 3. STEP RATE offers the possibilities of 4 step rates— 6, 12, 20 or 30 milliseconds. You can experiment to find the fastest rate your drives will accept. NUMBER OF SIDES permits single or double sided operation. DOUBLE STEP SOURCE AND DESTINATION are usually set to no unless you have an 80 track drive(s) that you want to act as a forty track drive. "YES" causes the drive to skip every other track. NUMBER OF TRACKS options are 35, 40 and 80.

When you are through configuring the program the prompts will ask if you are sure that it is correct. If it is the configuration is saved to disk until you change it again.

Copying a disk is a dream with COPYCAT. Once the program is loaded, put in the source disk and the destination disk and hit ENTER. COPYCAT does the rest. Once the copy is finished you may make another of the same or a different source disk by again hitting ENTER.

As I have stated time and time again, I do not believe in piracy. Nor do I believe in paying for a backup of a program that I have already purchased. It then follows that I do not believe that a disk should be copy protected. If we police ourselves there is no need for the protection and the high price of software. The prices of many packages are hiked to allow for the stealing and loss of profits. One program that had come across my desk recently encourages you to copy the program and spread it around to your friends. When they use the program they are asked to register with the author and pay for the program if they like it and plan to use it. If they do not plan to use it please pass it on. Obviously only registered owners can get support. I am going to check with the author in a couple of months to see how things are going.

I have found nothing yet that COPYCAT will not copy including a surprise. Since I use two slim line double sided drives in place of drive 1 in my Model 4, I configured the program for double sided operation from drive 1 to drive 2. In this configuration COPYCAT

continued on page 74

New Surge Protector



The SL IV, a multi-outlet surge suppressor designed to protect computers and other microprocessor-based equipment from transient overvoltages, has been introduced by Transtector Systems, Inc.

Incorporating Transtector's proprietary solid-state suppression technology, utilizing silicon junction avalanche diodes, the SL IV offers non-degrading, virtually permanent protection within operating parameters, and effectively eliminates computer downtime, component damage and nuisance failures caused by transients. Transients, which can originate from lightning strikes, power company grid switching, machinery operation and a variety of other internal and external sources, account for nearly 90% of all power line disturbances affecting microprocessor-based equipment.

The new Transtector SL IV also features a 15-amp circuit breaker with reset switch, status indicator lights for the circuit breaker and suppression circuitry and three high-quality grounded receptacles which accommodate most CPU/printer/CRT configurations and other multi-plug setups.

As with Transtector's other surge suppressors, the SL IV responds to transient occurrences within five nanoseconds (fivebillionths of a second), clamping even the highest-speed transients at a safe level, then automatically resets to the "ready" position.

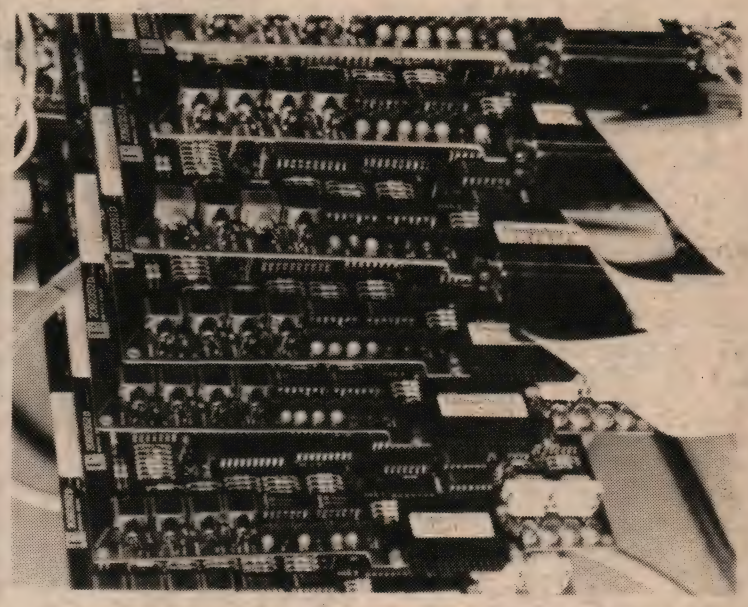
Any computerized equipment system drawing up to 15 amperes is appropriate for Transtector SL IV protection, including' microcomputers, computer terminals, intelligent photocopiers, electronic cash register systems, facsimile machines, electronic scale systems, telecommunications installations, electronic satellite systems, memory typewriters, automatic teller machines and medical laboratory analysis equipment.

The SL IV lists for $224.

For more information, or to learn the name of the nearest Transtector authorized dealer, call toll-free: 1-800-635-2537. In Idaho, call: (208)772-8515.

Mention that you read about it in *Computer Shopper*. ●

UDS Gets $3.5 Million Contract With CompuServe



UDS Modems in MicroNode

Universal Data Systems has made public a volume purchase agreement with CompuServe Incorporated totaling $3.5 million. The agreement, signed in April, 1984 and renewed in April, 1985, includes 1200, 2400, 9600 and 14,400 bit per second modems.

UDS modems are used by CompuServe both at the local MicroNode™ level (Photo 1) and at CompuServe's corporate headquarters in Columbus, Ohio. Over 600 MicroNodes in the U.S. provide local call access to the network for most CompuServe subscribers. Each of these MicroNodes contains a large number of UDS 212A modems which are the primary link between the user and the CompuServe network. These modems are connected to a multiplexer and linked to a custom UDS 9600 bit per second modem which transmits the data over a high speed leased line to either another MicroNode or directly to the facility in Columbus, Ohio. On the receiving end at the main facility is another UDS 9600 modem which is then linked to the front end processor of the mainframe computer.

CompuServe is in the process of upgrading its dial-up links to the popular 2400 bit per second rate using the UDS 224 modem. This capability is available now in more than 30 cities. The leased line segments will also be upgraded from 9600 bits per second to 14,400 bits per second using the new UDS 14.4 Trellis modem.

So far, more than 8,000 UDS modems have been shipped to CompuServe.

For further information contact Universal Data Systems, 5000 Bradford Drive, Huntsville, AL 35805-1953.

Mention that you read about it in *Computer Shopper*. ●

Toward The Ultimate continued from page 73

could be included but at a loss of simplicity.

The XMODEM Protocol

The XMODEM error checking scheme is outlined in Chart 1. A waiting time is provided for each end to come on line. If after about a minute and a half no response has been received by the sender, the program breaks off and returns to the Menu. Each Block of Data (128 byte blocks) is preceeded by its block number and this is checked by the receiver against its complement. A second checking portion uses the accumuluated "checksum" or total of all data bytes at the end of each block. If either the block number or the checksum don't check out the receiver sends a "Negative Acknowledge" (NAK) and the block is repeated. If too many (10) retries are made on a block a complete abort is made.

This scheme has been used for years in CP/M and with other machines but not much coverage has been given in TRS-80 literature. It offers an almost perfect final file when transmission is complete. However, it does have the disadvantage that it is slow. The back and forth acknowledging takes about 8 seconds to send each 128 character block. Also, since full 128 byte blocks are always sent, some final "garbage" will be transmitted at the end of a file. An ASCII BASIC file will load with no problems but CP/M BASIC will show a "Direct Statement in File" error at the end of the load. Simply LIST the program then do a SAVE and the end "junk" will be eliminated.

TERMINAL MODE
<CTRL> F
<CTRL> X

...Ready...

FILE TRANSFER MODE
(1) Send A File
(2) Receive A File
(3) See A Disk Directory

<CTRL> X

Figure 2 TERMINAL/CMD
A Simple Communications Program
Model 4 (Model III Mode)

Program Operation

There are two "Modes" or menus to TERMINAL. Figure 2 shows the startup menu (Terminal Mode). From here you can send Smart modem commands out to set up your end. You can also communicate with the keyboard once the other end is ready. The second phase is the File Transfer mode entered by typing a control F from terminal mode. Your three choices are then simple.

1. ready a file to SEND.
2. open a file to RECEIVE.

continued on page 180

COPYCAT continued from page 73

does one heck of a job on my MS-DOS disks for the Model 1000. As a matter of fact it copies programs that some of the MS-DOS copy programs will not touch due to the protection used. You know the type I mean. Everything goes well until you try to run the copy and it bombs. So far, only one of the "uncopyables" that I have cussed at is still holding out.

I have been told (but have not tried) of very successful copying of disks for the Color Computer and several others by COPYCAT. It would pay to experiment somewhat to see just what software this program will copy.

The documentation is short and direct. There are no problems with the program and it pretty much runs itself, so who needs documentation? The configuration process is well covered to eliminate confusion as to which option to select.

I can only praise OMNISOFT's COPYCAT 4.16. It is a fantastic program that exceeds expectations. If you don't have it already, you need to get it.

COPYCAT 4.16 for the Model III, V, 4D & P, $49.95. Omnisoft Research, 2170 W. Broadway, Suite 501, Anaheim, CA 92804. (704) 772-5000. ●

TEXAS INSTRUMENTS

Book Review, Understanding The TI PC

Reviewed by Dick Evans

Why should you want to know how your TI Professional Computer works? What will this knowledge do for you? In this little (6.5" x 8.5") booklet Mr. J.B. Dawson BSEE, MBA, has packed the answers to many more questions than you might know to ask. He has laid bare the heart and soul of the TI Pro.

This is not an encyclopedia nor an experienced software developers desk reference. The "Digest" is for us novices and those of you willing to work toward becoming better programmers. This too is a specific reference. It deals with the TI Professional Computer only. It will not teach you to program nor will it replace your MS-DOS manual.

You know what it isn't — now let's look at what it is. With the "Digest" your TI Pro (containing 128K RAM, 2 floppy drives, 3 plane graphics card [recommended, not required]) and a recommended printer, the "Tool Kit Diskette" and some uninterrupted hours, start at the beginning.

Chapter 1 gives you a quick tour of the various pieces and parts of your system and a few interesting points about them. The real fun begins in the next chapter. You will need MS-DOS 2.11 or later and MS-BASIC 1.2 or later in order to be able to actually do the exercise as they are laid out in the "Digest." "Just POKEing Around" helps you understand and use the PEEK and POKE commands in BASIC.

The diskette is worth not less than a dime for every penny it costs. All of the exercise programs are there, along with many more. And they are there in useful as well as usable forms. .EXE or .COM along with the .ASM and .LST versions. All without protection, and all for you to use. In the Introduction, Mr. Dawson grants you a license to USE his programs within your own. He also grants you the license to sell your programs that contain his code. They are copyrighted and there are restrictions on what you may do with his programs.

All of the program segments are explained and examples are provided to show you how they work and how using them can improve your program performance. Right after the demonstration of how sound can be incorporated I/O porting is explained. Do you know how many ports are available? Are there any additional ports available for future products? No suspense, there are 10 (counting disk ports as one) and there are addresses reserved for future expansion.

Does the MS-DOS manual explanation of DEBUG confuse you? Do you have any idea what a useful tool this is for customizing software? You're going to have to remember that the system uses the hexadecimal (base 16 — 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F) numbering system to display its memory contents. If you're a bit rusty about how "hex" works, go to Appendix A and take a quick review. Step by careful step you will walk into your system's memory and shed light on this deep dark mystery called Random Access Memory.

Having gone there and learned how to read and write directly into your system's memory — what can you do now? First, you can write your own Assembly Language routines. No, you won't learn how to do that in the "Digest," just how to get what you want, where you want it. You can also save these routines on a disk for later use. And, you will understand how to modify existing program code to fit your needs.

One very interesting section of the "Digest" covers the Interrupt Vectors. Both the TI and the IBM vectors are listed. Now the "EMULATE" portion of MS-DOS becomes more understandable. Maybe now you will also be able to grasp some of the problems of compatibility. It isn't easy, but knowing where things are and knowing where they should go does remove much of the frustration of connecting the two points. This will also help you to read and understand the memory map that one of the "Tool Kit Diskette" programs will generate for you.

By Chapter 5 you should be ready for some fun. This is where the "Digest" gets into graphics and how to get the most onto your CRT, quickly. This is done easily by using a utility program in Assembly Language that is on the diskette only. To prove its value a little demonstration is provided. Using BASIC's PRINT command, the program displays 15,360 characters. Then using the FASTPRNT utility, these same characters are again displayed. A significant difference in display time is easily seen. The program also includes a timer which provides the runtime of both displays, to the nearest second. This hampers the comparison a little since the FASTPRNT version actually takes less than one second to do its thing.

In Chapter 6 the disk drives are spotlighted. How to read and write data are covered. OOPS.COM is a valuable aid to those of us who suffer from two problems. Like others we make mistakes and ERASE/DELETE things that we shouldn't. Unlike some others we don't have a utility package that runs on our system and "unerases" files. Perhaps this is because we haven't wanted to or been able to invest the six to ten times price difference between this utility and the other one. Rejoice, our patience has been rewarded. Now we don't have to hope that what we want done can be done while in the "EMULATE" mode. Even if you won't buy the diskette, the Assembly Language program is listed in the "Digest." True, you will need the MS MACRO ASSEMBLER to make the code usable but, either way you won't have to go without OOPS.COM for much longer.

In the appendices you will find listed some of the other "Tool Kit Diskette" programs that are not covered elsewhere. The ANSI Driver and CAPACITY programs are very interesting and useful but, I think that the CHANGE.COM program is more valuable. Now you can change the volume and subdirectory names. Mr. Dawson has provided us with one of the utilities that is still missing from MS-DOS.

A complete listing of the "Application Tool Kit Diskette" begins on page 101. This is for those of you who haven't decided to buy both items. You will at least know what you are missing.

If you do more than purchase and run software, this little book and a copy of the diskette should remain close at hand every time your system is operating.

It doesn't do what it said it wouldn't and it does very well what it promised to do. I recommend you buy the pair. Either without the other is worth far less than the set.

Here is a listing of the programs that come on the Application Tool Kit Diskette:

SCRNPOKE.BAS a short program illustrating POKEing to TI PC screen memory.

3P-BIOS.BAS provides BIOS interface for detecting a 3-plane graphics card.

BIOSDEMO.BAS demonstrates BLOAD to screen memory BIOS interface.

BIOSDEMO.BLD binary file for BIOSDEMO.BAS.

BIOSSUB.BAS allows your BASIC program to interface with built-in ROM BIOS.

SOUND.BAS demonstrates how to use BIOSSUB.BAS in your program.

PORT.BAS shows how to use the ports to access disk drives and printer.

PORTS1.BLD Binary file used by PORT.BAS.

MEMMAP.EXE provides you with an assigned memory space map of your TI PC.

IRA.BAS used as a comparison to IRAFAST.BAS (uses standard PRINT).

IRAFAST.BAS shows how to use machine language FASTPRNT and increase speed.

FASTPRNT.BLD Machine-language program you can use in your own programs.

PRNTDEMO.BAS shows how FASTPRNT can display 15,360 characters in 1 second.

FASTPRNT.ASM Assembly source code for FASTPRNT (link to your own programs).

FASTPRNT.LST source code listing file.

GRDEMO.BAS accesses TI PC graphics memory directly.

BSBIOS.OBJ BLOADable machine-language interface to ROM DSR's.

S.V3G binary graphics file (used by GRDEMO.BAS).

L.V3R Truncated and offset binary graphics file.

HOUSE.PLA Truncated binary graphics file (for GRDEMO.BAS)

HOUSE.PLB Plane B of truncated binary graphics file.

HOUSE.PLC Plane C of truncated binary graphics file.

WIZARDS1.OBJ BLOADable file for DEOOh TI PC screen memory.

OOPS.COM A life saver. It recovers accidently DELETED files and programs.

OOPS.ASM Assembly language source code for OOPS.COM.

OOPS.LST Listing file.

WRITE75h.COM Used to learn disk drives (physical and logical sectors).

WRITE170.COM Helps teach how TI PC disk drives read and write.

SOUND.COM Uses speaker ROM DSR.

CONFIG.ASM ASCII dump of CONFIG. Use to configure Function Keys.

F1-F12.BAT Demonstrates configuring Function Keys with PROMPT command.

CAPACITY.ASM Assembly source code for CAPACITY.EXE.

CAPACITY.LST Listing file.

CAPACITY.EXE a DOS

continued on page 76

First Annual LA 99/4A Expo

The Los Angeles 99er Computer Group will host a 99/4A Expo on March 1 & 2, 1986 at the Shrine Exposition Hall, 700 West 32nd Street, Los Angeles, California.

The show will run from 10 a.m. to 6 p.m. and will include seminars, workshops and exhibits.

Advance admission is $4 for both days, $5 at the door.

For additional information write T. Masters, 148 S. Maple Drive, Beverly Hills, CA 90212 and enclose a SASE.

Mention that you read about it in *Computer Shopper*. ●

Randy's Ravings

by Randy Holcomb

This month's column is a little different as we will be dealing with a subject that's common to all computer users with special emphasis placed on TI users-telecommunications and Bulletin Board Systems (BBS's).

Since the rise in popularity in TIBBS's and other homegrown BBS's it has become cost-effective to call many of these BBS's using GTE's *PC Pursuit* service.

PC Pursuit allows computer users to place data-grade long-distance calls via the GTE Telenet network to reach computer systems for a flat $25 a month. A $25 one-time sign-up fee is required. This cost can more than offset the charges that can be incurred when using the major database services such as CompuServe, The Source, and Delphi for the user who is on a tight budget.

How it works. When you register with PC Pursuit, you will be asked for the number of the phone that will be used for originating PC Pursuit connections. This is the number that PC Pursuit will use to *CALL YOU BACK ON* to complete the connection (and to thwart unauthorized users from using the service!)

Dialing in. To access PC Pursuit you call the local access number. Upon carrier connect you receive the welcome banner to PC Pursuit and it asks you for the call-back number that PC Pursuit will ring you back on. Once entered, it will either tell you that you are not registered or it will ask you for the destination city and the destination number. When the city and number have been collected, PC Pursuit will tell you your position in the call queue and ask you to restart, continue, or hang up. If you select Y, PC Pursuit will tell you to wait for the call back and then hangs up. If you have a modem that is capable of auto-answer and it hasn't been set up to do this it would be advisable to program your modem to auto-answer. If you prefer to manually answer with your modem that's OK too.

After carrier is established, PC Pursuit will then go thru the following procedure: It places a request to the Telenet network to initiate a connection between you and the destination city's Telenet switch. If for some reason the destination city cannot be reached or is overloaded PC Pursuit will tell you that it cannot reach the city and will hang up on you (Fortunately, I have only seen this happen once in the several months I have used the service.) Now that the remote link has been established, PC Pursuit will attempt to dial the machine that you want to talk to, and if all goes well you will receive the "Connection Completed." message and you are now talking to the computer on the other end. If you are not connected immediately PC Pursuit will give you an informative message as to why you haven't been connected: for example if the number doesn't answer when it's called it will tell you that there's no response from the remote end and it it's busy it will tell you that the line is busy; in either case PC Pursuit will attempt to redial and re-establish a connection.

User Comment. PC Pursuit works quite well. The only real drawback is the amount of time necessary to establish a connection because of the call-back scheme, but this is more than offset by the cost savings offered by PC Pursuit. Another drawback is that the service is only available in major metropolitan areas initially: Washington DC, New York City, Los Angeles, Dallas, Denver, Detroit, Chicago, Atlanta, San Francisco, Boston, and Houston. GTE claims that service will be expanded to other cities over the next year. Another drawback is that PC Pursuit cannot be used to dial within the same area code even though the phone call may be a toll call; for example a person living in Detroit cannot use PC Pursuit to call a system in Ann Arbor (Ann Arbor is a toll call for a Detroit resident).

Support. PC Pursuit is fully supported by GTE Telenet and their customer service number is 1-800-336-0437 and is available 24 hours a day if you run into problems. GTE Pursuit also supports a Fido BBS on 1-800-835-3001 for the latest information on the PC Pursuit service. Billing can be done by check, or by charge (MasterCard or Visa) and registration and billing can be reached at 1-800-368-4215.

Why Use PC Pursuit? For $25 you get approximately 4 hours of connect time on the major commercial networks. For the same $25 you can call virtually every TIBBS listed in this issue of the *Computer Shopper* as many times as you want and not have to face a horrendous phone bill. For the person with a modem and a tight budget, PC Pursuit allows you to sample the BBS in the rest of the country without going deeply into debt.

Other TI News. TI is still working feverishly to get their new supermini/micro out the door. Latest reports are that they are retrenching and instead of releasing it with a Motorola 68020 as its backbone they will use the 32000 series developed by National Semiconductor and second sourced by TI. (As a side point, one of the rumors floating around was the one of a true 32-bit machine based on the 32032 from Atari called the "TT" series but was sacked because at the time National did not have a second source for the 32xxx series...)

For you Forth hackers. There is a recursive decompiler (listing 1) from the Central Arkansas Forth Intergest Group (CAFIG), submitted by Gene Thomas. For more information of CAFIG, write to them at PO Box 7668, Little Rock, AR 72205.

Whoops.... I just looked at the stack of mail that's been accumulating here and came to the realization that I have fallen severely behind in my duties in getting information out to the readership. A majority of the requests came in from that little blurb in the September *BYTE*, for people wonderig where they can find this or that, and also some requests on explaining how the TI Information Network on Delphi works. Barring any major earth-shattering news I'll devote the next column to identifying other TI sources and go thru a sample Delphi session including uploading and downloading. Also pending is a review of the GRAM Kracker from Miller's Graphics (and I am still in the process of acquiring the rest of the missing modules for the C compiler too.) So until next month, keep computing, and if you know of someone who's looking for a particular item, have them look **HERE** first for the **BEST** in prices and information. ●

```
1 ( RECURSIVE DECOMPILER ) BASE->R DECIMAL  TEXT
2 ."              LOADING:" CR
3 ." PHYSICAL SCRN# + NAME + LOGICAL SCRN#" CR
4 ." ------------------------------------" CR
5 BLK @ 3 .R ." :  RECURSIVE DECOMPILER    0"      -->
6
7
8   RECURSIVE DECOMPILER: BASED ON NORMAN HILLS, RAY DUNCUN
9   ROBERT ACKERMAN AND SYN-1 USERS GROUP. SEE 4TH DIM V1,N6
10   TI SPECIFICS BY JOHN FORSBERG, S.E. FL FIG CHAPT.
11   CONTINUOUS MODE STEP:  CRDCP XXXX, WHERE XXXX = THE WORD
12   TO BE DECOMPILED. SINGLE STEP MODE = RDCP.
13   IN SINGLE STEP MODE:
14   BAR WILL STEP TO NEXT WORD ON SAME LEVEL, ENTER WILL GO
15   DOWN A LEVEL, U KUP A LEVEL.  Q TO QUIT.
16   SDECOMP = RDCP.  CDECOMP = CRDCP

17 ( DECOMPILER )
18 CR BLK @ 3 .R ." :  RECURSIVE DECOMPILER    1  "
19 0 CLOAD CDEFINE  0 VARIABLE GIN ( NO. TO INDENT )
20 0 VARIABLE BASESAV
21 0 VARIABLE KEYSW  ( CONT. OR SREP SWITCH )
22 0 VARIABLE RDFEN  ( RECURSION FENCE )     HEX
23 ' C/L  @ CONSTANT CONST.ADR      ( RUN-TIME CFA )
24 ' BASE 2- @ CONSTANT USERV.ADR  (      "       )
25 ' GIN  2- @ CONSTANT VAR.ADR    (      "       )
26 : DEPTH  S0 @ SP@ - 2- 2 / ;
27 : ASCII  BL WORD HERE 1+ C@ [COMPILE] LITERAL ; IMMEDIATE
28 : GOV  OVER @ 2+ ;
29 : 2+D  2+ DUP ;
30 : .G@  0 4 D.R GIN @ ;
31 : DIN  CR DUP .G@ SPACES ;
32 : GIN+  CR OVER .G@ 2+D GIN ! SPACES ;  R->BASE -->

33 ( DECOMPILER )
34 CR BLK @ 3 .R ." :  RECURSIVE DECOMPILER    2 "   BASE->R HEX
35 : GCHKTYP   ( PFA -- F )  ( CHECK FOR FOLLOWING LITERAL )
36      CASE  ' BRANCH  OF 1 ENDOF
37            ' OBRANCH OF 1 ENDOF
38            ' (LOOP)  OF 1 ENDOF
39            ' (+LOOP) OF 1 ENDOF
40            ' (OF)    OF 1 ENDOF
41            0 SWAP ( FF RETURN - ENDCASE DROPS ADDR )
42      ENDCASE ;
43 : 1KEY  ( PFA -- PFA C )  KEYSW @
44       IF  ?TERMINAL  IF ASCII Q
45         ELSE DUP RDFEN @ U<
46         IF  BL - ELSE 0D THEN THEN
47       ELSE KEY
48       THEN ;          R->BASE  -->
```

```
1   CR BLK @ 3 .R ." :  RECURSIVE DECOMPILER    6 "  CR  BASE->R
2 HEX : RDCP SP! BASE @ BASESAV ! HEX
3   -FIND
4   IF DROP  0 GIN !  CR:
5   IF (GOESINTO)
6    ELSE NFA DISTYPE
7   THEN
8    ELSE ." NOT IN DICTIONARY"
9   THEN
10 CR BASESAV @ BASE ! ;
11 : CRDCP 1 KEYSW ! RDCP 0 KEYSW ! ;
12
13 : CDECOMP  CRDCP ;  ( DECOMPILE MULTIPLE LEVELS)
14 : SDECOMP  RDCP ;  ( DECOMPILE SINGLE LEVEL)
15   HERE RDFEN !     R->BASE   ;S
16 USAGE EXAMPLE:  TEXT SDEFINE  <cr>
```

Book Review, TI PC continued from page 75

enhancement to SIZE command and learning exercise.

1.BAT ANSI file to change DOS screen color.

2.BAT ANSI file to change DOS screen color.

3.BAT ANSI file to change DOS screen color.

4.BAT ANSI file to change DOS screen color.

5.BAT ANSI file to change DOS screen color.

6.BAT ANSI file to change DOS screen color.

7.BAT ANSI file to change DOS screen color.

8.EXE Demonstration program using built-in ANSI driver.

8.8.OBJ Object code for 8.EXE.

8..LST Listing file for 8.EXE.

8.ASM Assembly source code listing (shows how to use ANSI driver).

COLOR.OBJ Object code for COLOR.EXE.

COLOR.LST Listing file for COLOR.EXE.

COLOR.EXE Provides master menu for all ANSI driver programs.

COLOR.ASM Assembly source code for COLOR.EXE.

CHANGE.COM DOS enhancer. Allows changing Subdirectory and Volume Labels.

CHANGE.OBJ Object code for CHANGE.COM.

CHANGE.LST Listing file for CHANGE.COM.

CHANGE.ASM Assembly source code for CHANGE.COM.

"Understanding The TI PC: A Programming Digest" by J.B. Dawson. Published by PROSOFT, P.O. Box 50457, Phoenix, AZ 85076-0457. Copyright 1985. 108 pages — And — "The Application Tool Kit Diskette" by J.B. Dawson.

Digest alone: $9.95 + $1.50 S&H, prepaid by mail from the publisher.

Digest & Diskette: $19.95 + $1.50 S&H, prepaid by mail from the publisher.

Diskette alone: $15.00 + $1.50 S&H, prepaid by mail from the publisher. ●

TIMEX-SINCLAIR

Timex Sinclair Survival Column

by Mark L. Fendrick

The SOUND command on he T/S 2068 is probably the ost neglected of the new ommands because of the com- lexity involved to utilize it. In ddition, there is very little ac- ually written about it, relegat- ng SOUND to the powerful ut unused category. Let's ave a look at it now.

The T/S 2068 is capable of roducing some very sophisti- ated music. You can control hree separate channels of ound by manipulating the ourteen *registers* (storage loca- ions). We will look at these egisters and how they are us- d in a step by step fashion.

The very first thing which ust be done is to *enable* (turn n) the channel. This is done sing register 7, the enable egister. It is this register which ells any of the three channels o create a sound. The channels re designated as *A*, *B*, and *C*. When referring to these chan- els in BASIC commands, hannel A = 1, channel B = , and channel C = 3. To start sound on any of these chan- els, you must change the alue of register 7, which riginally will contain the alue 63 when all channels are isabled. You do this by sub- racting the value (or values) of he channels which you want o enable. To enable channel A ou would subtract 1 from 63 (62), to enable channel B you would subtract 2 from 63 (61) and to enable channel C you would subtract 4 from 63 (59). In BASIC, it would look like this:

To enable channel A:
SOUND 7,62
To enable channel B:
SOUND 7,61
To enable channel C:
SOUND 7,59

Sometimes you may find that you want to enable more than one channel at a time. This is accomplished by adding the values of the channels together and then subtracting that number from 63.

To enable channels A & B
(63 - [1 + 2] = 60)
SOUND 7,60
To enable channels A & C
(63 - [1 + 4] = 58)
SOUND 7,58
To enable channels B & C
(63 - [2 + 4] = 57)
SOUND 7,57
To enable channels A, B & C
(63 - [1 + 2 + 4] = 56)

SOUND 7,56

If you have tried these commands on your computer, you will have noticed that nothing happened. That is because you have turned the channel(s) on, but haven't told them what type of sound to produce. You still have to define the pitch, volume, and duration of the desired tone.

The pitch is controlled by two tuning registers for each channel. For channel A, these are registers 0 and 1; for channel B, they are registers 2 and 3; and for channel C, they are registers 4 and 5. For the most part, it is the lower of the two registers (fine tuning) which do most of the tuning. The higher of the two registers (coarse tuning) is used when the number in the fine tuning register exceeds 255. The values for the fine tune register can be in the range of 0-255, and the allowable values for the coarse tune register can be in the range 0-15. As the values in these registers increase, the pitch decreases. The progression of the values does not proceed in absolute steps, as they are based on the tone's frequency, but doubling or halving the value takes you up or down exactly one octave. The simplest way to get the proper values is to use one of the charts found in the T/S 2068 User Manual (page 187), Timex/Sinclair 2068 Intermediate/Advanced Guide (page 119) or TS 2068 Basics and Beyond (page 145). The following chart covers one octave. The values listed are for the fine tune register, with the coarse register set to 0.

NOTE	FINE TUNE VALUE
C	209
C#	197
D	186
D#	175
E	165
F	156
F#	147
G	139
G#	131
A	124
A#	117
B	110
C	104

Now we have enabled the channel and defined the pitch, but before any sound is produced, we must still specify the volume. There is a single volume register for each channel; channel A = register 8; channel B = register 9; channel C = register 10. The value range for this register is 0-15 (under normal circumstances). Setting the register to 0 turns the volume all the way down, effectively stopping the sound.

With these three elements, we can now start using the SOUND command. The procedure is to load the registers with the proper values and then enable the channel(s). We will first play a note (middle C) on channel A. First we will load the fine tune register for channel A (0) with the proper value from the chart above. (The coarse tune register initially is set to 0, and we will leave it that way.)

10 SOUND 0,209

In the second line of this program, we will turn channel A's volume to the maximum by loading register 8 with the value of 15.

20 SOUND 8,15

Finally we have to enable channel A.

30 SOUND 7,62

Now, you can RUN this program and produce a short tone. The short duration is due to the fact that the sound is automatically turned off when the program ends. If there were a long program following this routine, the tone would continue until the volume was set to 0, the channel was disabled, or the program ended. Try this next program which will produce the same tone at the identical volume.

10 SOUND 0,209;8,15;7,62
20 PAUSE 0

First thing you will notice is that we have combined all three lines of the first program into a single SOUND command in the second program. It is simply necessary to separate the sets of numbers by a semicolon. The second line will cause the program to pause until any key is depressed. Now, the tone will continue until you press a key which causes the program to continue - and end.

You can, of course, use all three channels at one time to produce more than one voice. The following program will build a C major chord. First, we will enable all three channels without any pitch or volume information. (Turn you computer off and then back on before you attempt this program to assure that all registers are set to their initial values.)

10 SOUND 7,56

Next we will cause channel A to play middle C at full volume followed by a pause of one second.

20 SOUND 0,209;8,15
30 PAUSE 60

Now, we will instruct channel B to play E at full volume, again followed by a one second pause.

40 SOUND 2,165;9,15
50 PAUSE 60

We complete the chord with a G played on channel C, followed by a pause which will continue until a key is pressed.

60 SOUND 4,139;10,15
70 PAUSE 0

Finally, we will set the tone and volume registers back to 0.

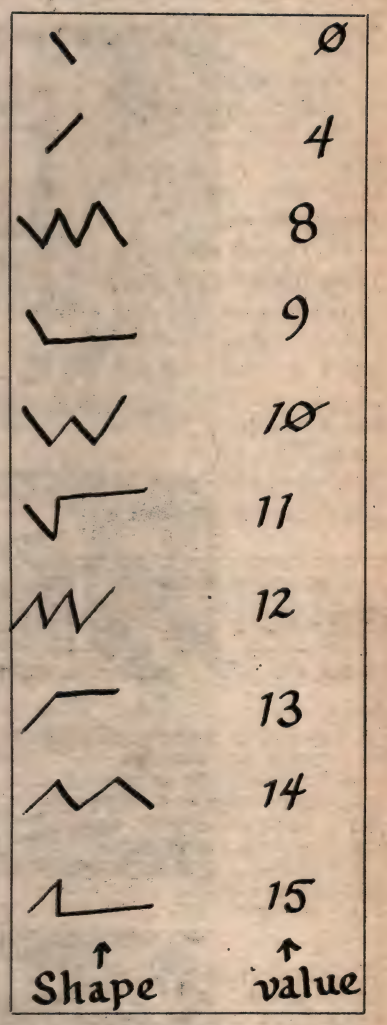
80 SOUND 0,0;2,0;4,0;8,0;
9,0;10,0

Actually, the sound would have ended when the program was finished, but this way, you can reRUN the program and have it work properly. Try leaving out this final line and see what happens. You can disable all three channels by setting register 7 back to its original value of 63, but this would not change the values of the other registers, and when any of the registers would be turned back on, the tone would start again. Try adding these lines:

80 SOUND 7,63
90 PAUSE 60
100 SOUND 7,62
110 PAUSE 60
120 SOUND 7,61
130 PAUSE 60
140 SOUND 7,59
150 PAUSE 60
160 SOUND 7,63
170 SOUND 0

Try experimenting with this program to see what happens by turning registers on or off and by changing values.

So far, the type of music we have created has been all on one level. For those of you who are concerned with what is called dynamics in music, what we produced up until now has been rather flat as far as dynamics are concerned. If you think about a piano, for instance, you will realize that the music produced by striking a key starts at a certain level and then fades immediately. A violinist will add *vibrato* to a single note giving it more texture than it would have ordinarily. These affects can be produced on the T/S 2068 by controlling what is called the *envelope*. By using additional



registers, you can actually shape the music you create.

By setting the volume registers (8,9,10) to 16, you turn control of the tone to an envelope which you can determine. You cannot, however, set a different envelope for each channel. You can either give control of a channel to your selected channel, or allow it to remain under your standard volume control, but all channels controlled by the envelope will be controlled by the same selection. Registers 11 and 12 control the period of the envelope - the time it will take for the volume to build or fade. Fine tuning is accomplished using register 11, coarse tuning is accomplished with register 12. The value range for each of these registers is 0 to 255. Register 13 is the register which will hold the shape of your envelope (see chart). By adding the following numbers to these values, and loading into register 13, you have complete control over the sound. Adding 4 to these values will cause the volume to build rather than fading; adding 1

continued on page 171

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MISCELLANEOUS

A Laymans Guide To Understanding AI

Part I

by Dick Evans

AI (Artificial Intelligence)

Before we get serious about trying to understand what AI is, why it is and what useful purpose it might have, let's go back a little way in time to see just where AI had it's beginning. It's "pre-history" actually dates back to Greek mythology; however, we're not going to go back quite that far. You can check out the activities of Hephaestus, Pygmalion and Daedalus if you're really set on starting at the very beginning. We will also pass quickly over the talking head of Pope Sylvester II, the zairija, the Ars Magna, a homunculus, the original Golem and Frankenstein's Monster. this brings us closer to the times and activities of HAL, C-3PO and R2-D2. The movie personalities created by men to make their pictures "work". The same thread is still there, it's just becoming more visible.

Why did man build the first machine? He built it to make his work easier. Now that he had the machine, what became the next step? He built a "better" machine that was able to do the work without the man working at all. From that point the next step would be easy. He would build an even better machine which would do the work when the man was not there. It would know when to start work and when to stop working. We have gone from a simple machine through a modern computer controlled machine to a C-3PO type robot. Did this seem like a quick trip? It was; because, in reality things are happening quickly.

Today and yesterday, or forty years ago, the question posed by Alan Turing: "Can machines think?" is being discussed, debated, debunked and deified. To those who say, "Impossible!" "It can't be done!" I would pass on a warning given to me by my Grandfather: "Impossible doesn't exist, given the time, intelligence and money needed, anything can be done." Another of his comments is also appropriate: "The man saying, 'it can't be done' is most often interrupted by the man doing it." Just where your beliefs are concerning thinking machines should not prevent you from continuing to enjoy this "guide." What is important is that you understand what is being developed under the general term of "Artificial Intelligence."

The starting point for "AI" was a conference held in the summer of 1956. The term "artificial intelligence" was first applied to the field of study that was the primary topic of that conference. The work done after that conference by the participants and their students has provided many of the building blocks for today's computers. Some of those individuals and their contributions are listed below.

John McCarthy invented the LIst Processor programming language (better known as LISP). It remains the most common AI language. He is also responsible for the time-sharing process which is the heart of multi-user, multi-tasking modern computers. Marvin Minsky, another participant, has provided much of the original work on the organization and representation of knowledge structures. Two other attendees were Allen Newell and Herbert Simon. They brought with them what is considered to be the first operational AI program. It is called the Logical Theorist and was described by them as an information processing program. It also has the distinction of being among the first successful programs to use heuristic reasoning. Heuristics are rules of thumb. They may solve a given problem but are not guaranteed to do so. This is different from algorithmic reasoning. Algorithms always arrive at a result.

Arthur Samuel owes his place in AI history to a game program. Why so much fame for a game program (checkers, at that)? For starters, he proposed it in 1947 and it wasn't able to play master's level games until 1961. Part of the reason it took so long was that Mr. Samuel designed the program to learn from its mistakes. This disproved the canon that a computer can do exactly what it is programmed to do and it cannot exhibit original behavior.

Alex Bernstein concentrated his efforts into a chess game. It never reached the master's level of the checkers game. It earned its place in AI history because of the heuristic techniques used to determine the best moves.

Names and games can be dry stuff; but they are also the basics of understanding how the improvements in computer technology and continuing research have made artificial intelligence the hightech "buzzword" of the day. "Buzzwords" get press and money. Everybody has to have the latest and the greatest. Just what you are going to get for your money now and some "educated" guesses on what is coming in the near future are subjects that we will go into further on in this discussion. Let's get away from the people and games a bit and move quickly through the 1970s.

During that period of history most of the AI activity was confined to the university research facilities in a few places around this country. Other countries were also studying AI. All of this research was computer based. So, the computer companies were involved from the start too. The most notable of these companies was Digital Equipment Corporation (DEC) whose minicomputers, at $20,000.00 each, were a welcome alternative to IBM mainframes. TI's entry came with the Explorer, a low cost LISP machine, in 1985. There were and are other players in the field; but, this article is not designed to make you an expert on AI.

As it happens, "experts" are our next topic in the form of "expert systems." Hopefully we can wade through the "hype" in the trades and other places to take a look at just what an "expert system" is and why it comes under the heading of AI.

Everyone knows a few "experts." Some, they avoid and a few, they trust with their lives. Doctors, engineers and other very experienced, well qualified individuals, of proven ability, are due the title of "expert." There are also a number of others who are called "experts." As individuals, these experts do their best for as many as possible. They still cannot clone themselves to be in more than one place at a time. Or can they? If you take the AI concepts of heuristics (those rules of thumbs) and the expertise of the individual on how to use the rules, you are developing an "expert system" that can be duplicated. These are usually grouped under the heading of "rule based systems." (There is another grouping that we will look at later.) Will this reduce or eliminate the need for human experts? It is unlikely. What it is going to do is allow the human expert to concentrate on the problems that the "expert system" is unable to solve or inaccurate in solving.

Now that we know just enough to be dangerous, let's take a simple look at the pieces (components, for the techies) that make up an expert system. There are only three basics pieces. The knowledge base, the inference engine and the user interface. The knowledge base is that part of the system which contains all of the available facts about the problem that it is designed to solve.

Expert systems are designed to solve specific problems. These are defined as the "domain" of the expert of the "area of expertise." Just as the human expert is a specialist, so also, is the program designed around his expertise.

Both the facts about the area and the procedures used to solve the problems within this area are stored in the knowledge base. This means that the knowledge base is the distilled contents of all of the best texts on the subject.

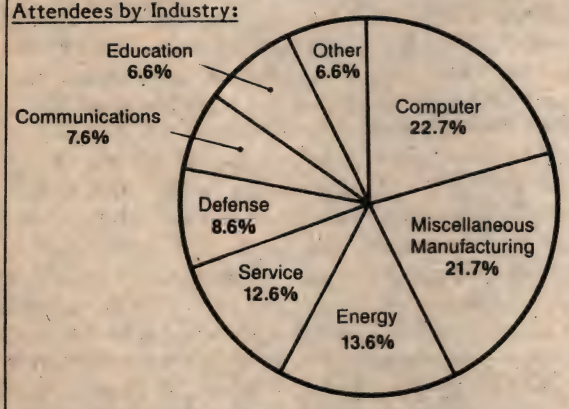
The second piece, the inference engine is sometimes called the control structure or the rule interpreter. What this piece does is pretty well revealed by the names applied. It is the system "driver." It selects the rules and facts to be used, how each is to be applied and when each is to be applied. This is the time piece that requires the human model(s) to input their expertise. This same inference engine can also be used with different knowledge bases; however, they are not totally interchangeable. Their domain limits are specified, however oil drilling is drilling for oil. Only the facts will change, not the expertise on how to do it.

By changing the knowledge base the usefulness of the inference engine can be extend-

continued on page 80

AUDIENCE PROFILES FROM TI's AI SYMPOSIUM, NOVEMBER 13, 1985

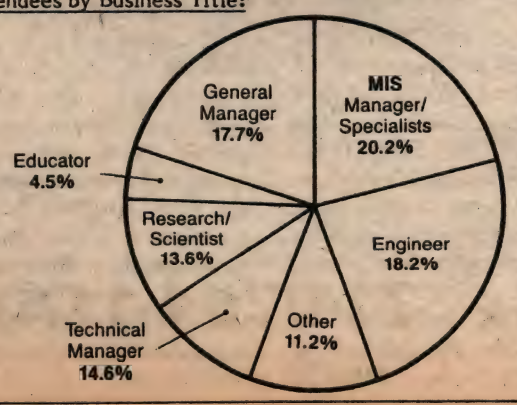
Attendees by Industry:



Current Level of Knowledge-based Systems Activity Among Attendees:

"Just beginning to explore potential"	40.9 %
"Building generic knowledge of the technology"	23.2 %
"Plans under development for identified needs"	17.2 %
"Specific applications under development"	12.1 %

Attendees by Business Title:



Probots And People

Robot Hobbyists

by Tim Knight

In the latter half of 1976, a bearded young man stood up in an auditorium at Stanford University and announced that he had created his own computer and wanted everyone to look at it. Xeroxed copies had been made of the design, but a lot of people criticized the machine for having the wrong microprocessor and not being sophisticated enough. However, another person at that meeting, several years younger, felt that perhaps there was a market for such a machine, and the two began talking about forming a company to sell the computers.

These two particular people are the legends of entrepreneurial success. They were two of hundreds of overnight millionaires (and, in a few cases, billionaires) spawned from what was, for a while, a "Garden of Eden"as one of those young men stated years later. Steven Wozniak, his partner, and Steven Jobs, probably now see the Silicon Valley, that "Eden," as a shadow of its former self. Now that the start-up days of the personal computer revolution are over (or at least radically altered), some people wonder if there's any more hope for the Silicon Valley or for electronics in general. Is the magic gone?

Some think that the magic is gone...for now. But they also know that in those same garages, auditoriums, and electronics stores that were the breeding ground for dozens of large computer companies, there is another revolution brewing--that of personal robotics.

Homebrew Robotics

The breeding ground of so many of those computer companies was the Homebrew Computer Club. A typical night's attendance in 1976 included venture capitalists, soon-to-be Silicon Valley legends and dozens of computer hobbyists whose sale goal in life seemed to be to create a computer that was enjoyable and astounding to their friends.

By no coincidence, there now exists an organization based very much on the Homebrew concept. The Homebrew Robotics Club, founded by Richard D. Prather (91 Roosevelt Circle, Palo Alto, CA 94306), meets monthly at Dick's place of work--the Alza Pharmaceutical Company. In the sleek auditorium, dozens of robot enthusiasts convene to discuss what subject is the topic of the evening and whatever news has come up over the past month. No one knows, who, if anyone, is the Steven Jobs of personal robots, but since nearly everyone knows in the back of their mind that *maybe* there's somebody in there who's going to reach that kind of level someday, there's a constant electricity in the air. Moreover, the individuals attending the meetings exchange knowledge and serve as catalysts that simply cannot be reproduced with two or three people discussing a robotic applications by themselves.

When I talked with Dick Prather at his home, he was as amiable and informed as ever. He wanted to show me all he had done recently with his robots, proudly describing what projects were "in the works." When I asked him what the purpose of the hobbyist was, he grinned as if he'd heard the question a dozen times before and told me that a robot hobbyist is a person so interested in robots that he will spend his time and money generously in designing and creating his concept of a robot. Although Homebrew roboticists will be the first to have household robots, Dick said, somewhere in the back of their minds they have a dream that someday *their* robot will be as popular as the Apple II computer and will be in millions of homes.

The robot hobbyist is usually defined as someone who wants to construct a robot that is completely independent. It can move about on its own and can interact with its environment. Richard Prather has created three complete robots called Abraham, Issac, and Ishmael. Although they are relatively crude prototypes, they represent a lot of work on Prather's part and his pride in them is almost paternal.

Dick isn't completely optimistic about the business of personal robots right now. He claims that "It's a fad...Talking about personal robots today is like selling the bearskin before you've shot the bear." However, it could be that hobbyists like Prather will form the first useful and popular personal robot.

RSA and Other Clubs

There are other robot clubs, most of them in the Silicon Valley, that cater to the robot enthusiast and builder. They include:

Robotics Interest Group (ROBIG)--For $15 a year, you can join this group located at 3205 Sydenham Street, Fairfax, VA 22021.

Robotics Society of America (RSA)--Although there are a number of RSA chapters across the country, you can locate the one in your area (or join the club for $15 a year for students or $25 a year for adults) by contacting Walt Tunick at 200 California Avenue, Suite 215, Palo Alto, CA 94306.

Robotics Experimenters Amateur League (REAL)--This organization also has chapters in various places in the United States. You can contact them at P.O. Box 3227, Seal Beach, CA 90740.

Each of these Clubs wants to provide its members with the latest information on robots and the projects of other members. It's a lot of fun to attend the meetings and find other people with similar interests; more importantly, clubs like these will help people learn from each other and will bring the day of the personal robot closer.

Differences Between Computers And Robots

The computer "nerds," as they were sometimes called, of the Homebrew Computer club are being replaced by the "gearheads" of Homebrew Robotics and other clubs. The things that were stereotypical of a person interest in building his own computer were usually an interested in mathematics, a fascination with problem-solving, and a somewhat anti-social attitude that was, ironically enough, largely responsible for the success of the personal computer.

Robot nuts, however, are somewhat different. They can probably be best categorized as people with big dreams. They speak of robots cleaning the house, entertaining guests, walking the dog, and doing other things which are almost impossible to do with a robot today even if you had unlimited money and engineering talent. However, these same dreams will lead to lesser realities that will put us a step closer to the C3PO everyone dreams about. For example, the same person who wants a robot to clean the house may not get his creation to do the dishes and wash the windows, but perhaps he'll get started with simply a vacuuming robot. This in itself is a start, and the wild dreams of the hobbyists create the small victories that produce exciting advances in personal robotics.

Besides being dreamers (in a positive way), people interested in robots seem more interested in helping people than they are in shutting out the rest of the world with their hobby. You will often hear robot hobbyists discussing what uses robots could have in the home, how they could help the elderly and disabled, and how a robot could be made safe around dogs and small children. The reason for this concern is that robots function in a real environment (rather than sitting on a desktop) where they'll usually be interacting with other people. Because of this, robots need to be made safe and hobbyists know that his safety must be an integral part of their creations.

People who build their own robots aren't all out there to save the world. Some of them like to build something they can show off to their friends. Others see robots as an engineering challenge they want to overcome with their mind. Still others dream of becoming millionaires and living in the Los Altos Hills of the Silicon Valley, complete with a Ferrari.

However, robot clubs are highly important to the industry. By discussing these clubs and their benefits, I am not suggesting that two young men will stand up one day at the Homebrew Robotics Meeting and proceed to form one of the largest personal robot companies in the world...but you never know. ●

Layman's Guide
continued from page 79

ed and expanded. This means that the human expert can actually become more expert via the system. It also means that copies of the inference engine can be used with different knowledge bases to solve more problems faster.

The third piece of the system, the user interface, is the one most of us will be able to identify with best. The user interface is the communications portion of the system. It does all of the input (questions) and output (answers) functions of the system. Here too, is possibly the area of most conflict. The designer of an I/O system is usually a computer expert. The user of the I/O system may be me, who may soon qualify for the title of "novice," or you, whose qualifications are unknown. One of the ways that this problem is being solved is through the use of a "natural language front end." This is an add-on to the user interface which allows the end user to talk to the computer (expert system) and for the expert system (computer) to understand and respond.

Now that we know a little about the application of AI, in the form of expert systems, let's carry this on a bit further. What should an expert system be and where might expert systems be used? First, what qualities or abilities should the expert system have?

USEFULNESS: It should meet a recognized need.

SIMPLICITY: A novice should be able to operate it.

INSTRUCTIVE: It should increase the expertise of a novice user and give the reasoning for its recommendations.

RESPONSIVENESS: begin solving problems at the users level of understanding.

INQUISITIVE: ask questions which will increase the system knowledge base.

MODIFIABILITY: be able to add, change or delete the contents of the knowledge base quickly to correct errors or add new information.

Given all of these things that the system "should" be, where would you expect to find these expert systems being applied? May I suggest a few possibilities?

INTERPRETATION: speech understanding.

PREDICTION: weather forecasting.

DIAGNOSIS: medicine.

DESIGN: circuits.

PLANNING: military.

MONITORING: power plants.

DEBUGGING: software.

REPAIR: computers, autos, planes.

INSTRUCTION: tutors (remedial, advance)

CONTROL: traffic (air, auto, phone)

Next time we will take a look at some more of the "how" and "what" of expert systems. We will also take a look at the different types of expert systems and some of the developments that are taking place. In the meantime, you might want to run right out and purchase a copy of PC SCHEME. ●

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This top of the line daisywheel printer is made by a major market leader in daisywheel printer products. Its quality and durability are well known. Through special arrangements we are offering it to you direct. The price is far below the dealer quantity 100 price level. We fully support the product and make available all accessories that you may want for it.

When this printer starts printing, hang on to your keyboard. It sprints through correspondence at a rapid 36 characters per second — that's one-third faster than the average daisywheel printer.

This bidirectional, logic seeking marvel lets you adjust the hammer intensity to print anything from single-page letters to five-part forms with equal clarity. A variety of impressive typestyles give you added print versatility.

It is exceptional in many other ways. The 15½" wide carriage briskly prints all your ledgers, spreadsheets, and extra wide business graphics with ease. With the optional cut sheet feeder and tractor feeder, you can print several copies on your letterhead and switch to pin-fed paper for high volume word or data processing.

The 7K buffer holds a substantial amount of data while its printing.

The average life of the print wheel is 10 million characters. Which means that you can run it eight hours a day — every day of the week — for almost two full years. Of course, under more normal usage, it will handle your business correspondence and graphics for up to five full years without service. That's impressive.

Quiet quality.
What your eyes don't tell you, your ears will. Because this printer is much quieter than many more expensive printers. So you can keep the noise down while you keep the cost down.

Specifications

Print Speed	36 CPS (Shannon text)
Print Wheel	96 petals/wheel, cassette type, ASCII stand.
Print Wheel Life	10 million char./wheel
Characters/Line	132 characters (1/10"), 158 characters (1/2"), 198 characters (1/15")
Paper Width	16.5 in max (419 mm)
Copy Capacity	Original (45 kg) + 4 copies (15 kg) (total thickness 0.35 mm max.)
Carriage Motion	Bidirectional, logic seeking
Carriage Rtrn Speed	750 ms (at 13.2" return)
Line Spacing	6, 4, 3 lines/inch, 1/48" proportional increments
Paper Feed	Bidirectional, logic seeking
Paper Feed Speed	4"/second

Available Ribbons

	Ribbon Life
Single-strike black carbon film	60,000
Multi-strike black carbon film	150,000
Single-strike black correctable film	70,000
Multi-strike black fabric	500,000
Single-strike red film	2,000
Correction tape	1,500

Interfaces	Centronics – Parallel RS-232C – Serial
Buffer Size	7K
Control Panel	Indicators: Select, Power, Alarm, Line, Pitch, and Copy (LEDs) Switches: Select, Line Feed, TOF, Line, Pitch, and Copy
Noise	Operating – Less than 65 dB
Temperature	50 to 105 F – 10 to 40 C (operating)
Humidity	20% to 80% non-condensing (operating) 5% to 90% non-condensing (storage)
Power	120 V, 60 Hz (Optional: 120 or 220 - 240 V, 50/60 Hz) 130 W Max.
Dimensions	21.18 (W) x 7.65 (H) x 15.15 (D) inches (538(W) x 194.5 (H) x 385 (D) mm)
Weight	33 lbs (15 kg)
Optional Features	Tractor feeder, Auto Cut Sheet Feeder, Single and Multi-strike ribbons, Interchangeable printwheels (Numerous languages and typestyles)

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AVAILABILITY AND TYPE ERRORS

MidWest Micro-Peripherals

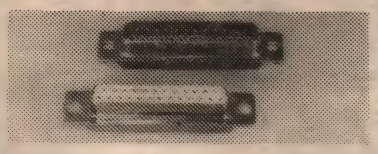
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All equipment shipped factory fresh with manufacturers warranty

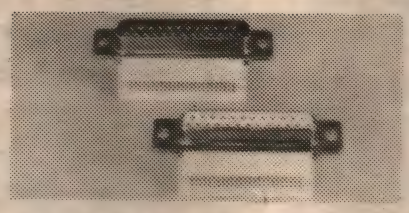
HIGH TECHNOLOGY — NOT HIGH PRICES

D—SERIES CONNECTORS



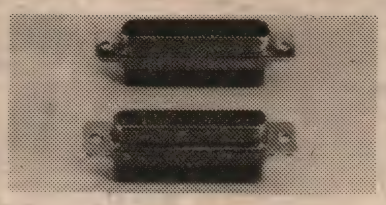
SOLDER POT

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
9P	9 pin male	0.84	0.76	0.70
9S	9 pin female	0.96	0.87	0.80
15P	15 pin male	0.96	0.87	0.80
15S	15 pin female	1.10	1.00	0.92
25P	25 pin male	1.10	1.00	0.92
25S	25 pin female	1.20	1.09	1.00
37P	37 pin male	1.64	1.49	1.37
37S	37 pin female	1.80	1.64	1.50
50P	50 pin male	2.62	2.38	2.18
50S	50 pin female	3.70	3.36	3.08



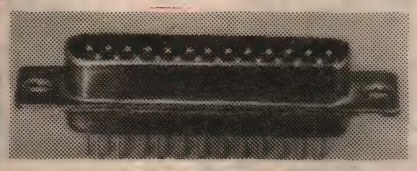
RIBBON CABLE TYPE

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
IDC9P	9 pin male	2.35	2.17	2.01
IDC9S	9 pin female	2.53	2.34	2.17
IDC15P	15 pin male	3.10	2.86	2.66
IDC15S	15 pin female	3.25	3.00	2.79
IDC25P	25 pin male	3.73	3.45	3.20
IDC25S	25 pin female	4.28	3.95	3.67
IDC37P	37 pin male	4.75	4.38	4.07
IDC37S	37 pin female	5.63	5.20	14.83
IDC50P	50 pin male	12.98	11.98	11.13
IDC50S	50 pin female	14.47	13.35	12.40



EMPTY CRIMP SHELLS

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
C9P	9 pin male	0.70	0.62	0.56
C9S	9 pin female	0.70	0.62	0.56
C15P	15 pin male	0.73	0.64	0.58
C15S	15 pin female	0.73	0.64	0.58
C25P	25 pin male	0.75	0.67	0.60
C25S	25 pin female	0.75	0.67	0.60
C37P	37 pin male	0.96	0.87	0.80
C37S	37 pin female	1.00	0.91	0.83
C50P	50 pin male	1.12	1.02	0.93
C50S	50 pin female	1.14	1.04	0.95



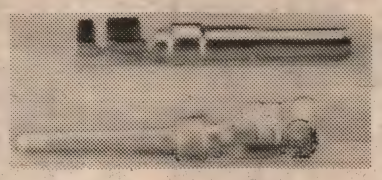
PC MOUNT STRAIGHT

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
P9P	9 pin male	0.90	0.82	0.75
P9S	9 pin female	1.38	1.25	1.15
P15P	15 pin male	1.12	1.02	0.93
P15S	15 pin female	1.98	1.80	1.65
P25P	25 pin male	1.56	1.42	1.30
P25S	25 pin female	3.06	2.78	2.55
P37P	37 pin male	2.14	1.95	1.78
P37S	37 pin female	4.36	3.96	3.63
P50P	50 pin male	2.74	2.49	2.28
P50S	50 pin female	5.68	5.16	4.73



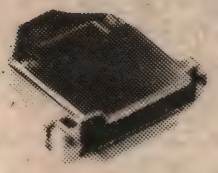
PC MOUNT RIGHT ANGLE

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
R9P	9 pin male	1.60	1.45	1.33
R9S	9 pin female	1.62	1.47	1.35
R15P	15 pin male	1.52	1.38	1.27
R15S	15 pin female	1.54	1.40	1.28
R25P	25 pin male	1.96	1.78	1.63
R25S	25 pin female	1.98	1.80	1.65
R37P	37 pin male	2.94	2.67	2.45
R37S	37 pin female	2.98	2.71	2.48



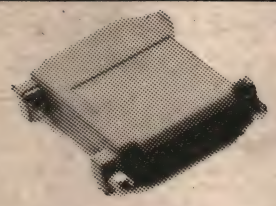
CRIMP CONTACTS

PART #	DESCRIPTION	PRICE/QTY 1-99	100-999	1K-4999
CP20P	male contact	0.080	0.063	0.050
CP20S	female contact	0.100	0.068	0.054



GREY HOODS

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
GH9	9 pin hood	0.68	0.60	0.54
GH15	15 pin hood	0.80	0.71	0.64
GH25	25 pin hood	0.85	0.76	0.66
GH37	37 pin hood	1.06	0.96	0.88
GH50	50 pin hood	1.10	1.00	0.92



DUAL HOODS

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
DH25	25 pin hood	1.13	1.00	0.90
DH37	37 pin hood	1.17	1.04	0.94

SHIELDED HOODS

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
SH9	9 pin hood	0.80	0.71	0.64
SH15	15 pin hood	0.88	0.78	0.70
SH25	25 pin hood	1.00	0.89	0.80
SH37	37 pin hood	1.72	1.56	1.43

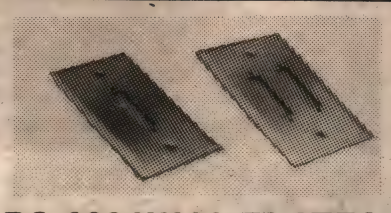
D-SERIES HARDWARE

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
MDH-1	male d-series hardware	0.55	0.35	0.25
FDH-1	female d-series hardware	0.75	0.65	0.55



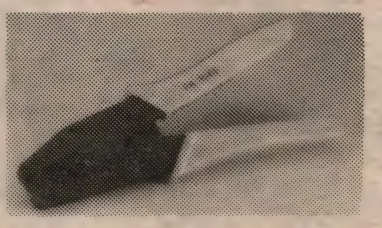
AMP HOOD

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
AH25	25 pin hood	1.25	1.00	0.83



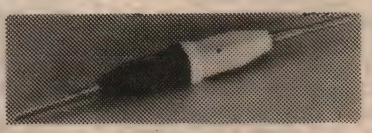
RS-232 WALL PLATES

PART #	DESCRIPTION	PRICE/QTY 1-9	10-24	25-49
WP-1	one slot	1.88	1.36	1.25
WP-2	two slot	2.13	1.55	1.42



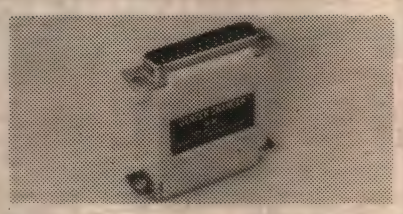
CRIMPING TOOL

CT-1645	professional ratchet type	79.95



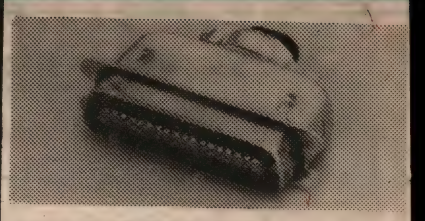
EXTRACTOR TOOL

EXT-1	removes crimp contacts	2.75



RS-232 GENDER CHANGERS

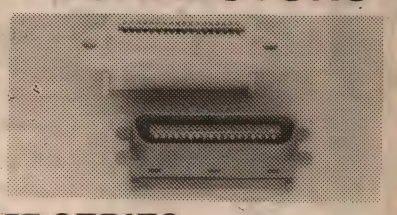
PART #	DESCRIPTION	PRICE/QTY 1-9	10-24	25-49
AGC-M	male gender changer	7.95	7.27	6.67
AGC-F	female gender changer	7.95	7.27	6.67



CENTRONICS SOLDER TYPE

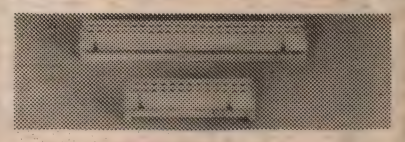
PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
CEN-36P	36 pin male	3.00	2.67	2.40
CEN-36S	36 pin female	3.66	3.33	3.05

RIBBON CABLE CONNECTORS



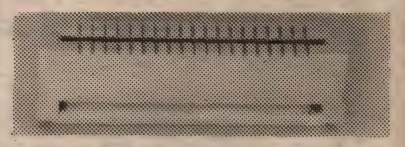
57 SERIES

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
ID57-24P	24 pin male	5.00	4.62	4.29
ID57-24S	24 pin female	5.50	5.08	4.71
ID57-36P	36 pin male	4.25	3.78	3.40
ID57-36S	36 pin female	5.50	5.00	4.58
ID57-50P	50 pin male	8.03	7.42	6.89
ID57-50S	50 pin female	7.52	6.94	6.44



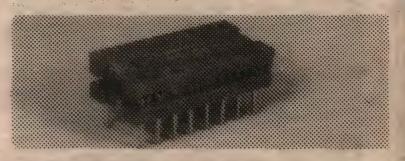
IDS SOCKET CONNECTOR

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
IDS10	10 pin socket	0.94	0.85	0.78
IDS14	14 pin socket	1.00	0.91	0.83
IDS16	16 pin socket	1.12	1.02	0.93
IDS20	20 pin socket	1.18	1.07	0.98
IDS26	26 pin socket	1.50	1.36	1.25
IDS34	34 pin socket	1.78	1.62	1.48
IDS40	40 pin socket	1.98	1.80	1.65
IDS50	50 pin socket	2.32	2.11	1.93
IDS60	60 pin socket	2.70	2.45	2.25



IDE EDGECARD CONNECTOR

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
IDE10	10 pin edg.crd.	1.30	1.16	1.04
IDE14	14 pin edg.crd.	1.55	1.38	1.24
IDE20	20 pin edg.crd.	1.75	1.56	1.40
IDE26	26 pin edg.crd.	2.13	1.89	1.70
IDE34	34 pin edg.crd.	2.50	2.22	2.00
IDE40	40 pin edg.crd.	2.88	2.56	2.30
IDE50	50 pin edg.crd.	3.50	3.11	2.80

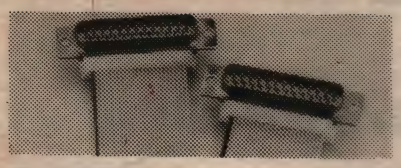


IDD DIP PLUG CONNECTORS

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
IDD14	14 pin dip plug	0.85	0.77	0.71
IDD16	16 pin dip plug	0.95	0.86	0.79
IDD24	24 pin dip plug	1.65	1.50	1.38
IDD40	40 pin dip plug	2.75	2.50	2.29

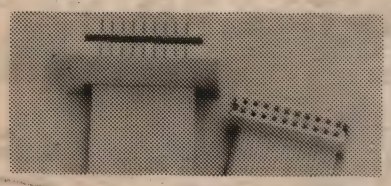
ALTEX ELECTRONICS

RIBBON CABLE ASSEMBLIES



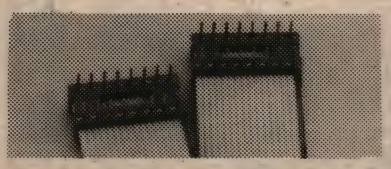
D-SERIES

PART #	DESCRIPTION	PRICE
9P-9P	9 pin male to male	5.64 + .18 per ft.
9P-9S	9 pin male to female	5.86 + .18 per ft.
9S-9S	9 pin female to female	6.08 + .18 per ft.
15P-15P	15 pin male to male	7.44 + .30 per ft.
15P-15S	15 pin male to female	7.62 + .30 per ft.
15S-15S	15 pin female to female	7.80 + .30 per ft.
25P-25P	25 pin male to male	8.96 + .50 per ft.
25P-25S	25 pin male to female	9.62 + .50 per ft.
25S-25S	25 pin female to female	10.28 + .50 per ft.
37P-37P	37 pin male to male	11.40 + .74 per ft.
37P-37S	37 pin male to female	12.46 + .74 per ft.
37S-37S	37 pin female to female	13.52 + .74 per ft.
50P-50P	50 pin male to male	25.96 + 1.00 per ft.
50P-50S	50 pin male to female	27.45 + 1.00 per ft.
50S-50S	50 pin female to female	28.94 + 1.00 per ft.



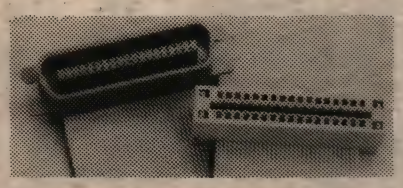
IDS SOCKET TO IDE EDGECARD

PART #	DESCRIPTION	PRICE
10S-10E	10 pin socket to edg.crd.	3.20 + .20 per ft.
14S-14E	14 pin socket to edg.crd.	3.50 + .28 per ft.
20S-20E	20 pin socket to edg.crd.	3.75 + .40 per ft.
26S-26E	26 pin socket to edg.crd.	4.75 + .52 per ft.
34S-34E	34 pin socket to edg.crd.	5.40 + .68 per ft.
40S-40E	40 pin socket to edg.crd.	6.45 + .80 per ft.
50S-50E	50 pin socket to edg.crd.	7.85 + 1.00 per ft.



IDD DIP PLUG TO IDD DIP PLUG

PART #	DESCRIPTION	PRICE
14D-14D	14 pin dip plug cable	2.60 + .20 per ft.
16D-16D	16 pin dip plug cable	2.75 + .32 per ft.
24D-24DE	24 pin dip plug cable	3.75 + .48 per ft.
40D-40D	40 pin dip plug cable	7.50 + .80 per ft.

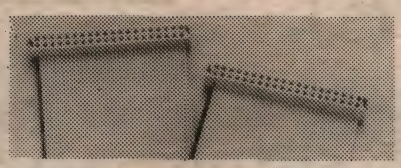


RADIO SHACK PARALLEL PRINTER CABLE

PART #	DESCRIPTION	PRICE
36P-34E	36 pin male to 34 pin edg.crd.	8.50+.68 per ft.

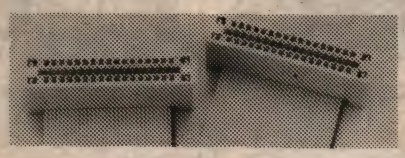
HARD DRIVE CABLE ASSEMBLIES

PART #	DESCRIPTION	1-9	10-24	25-49
HDC-22	22" hard drive cable assy.	8.50	7.73	7.08



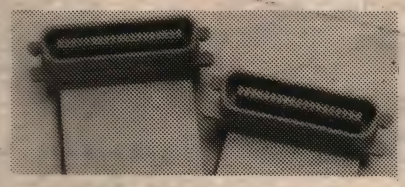
IDS SOCKET TO IDS SOCKET

PART #	DESCRIPTION	PRICE
10S-10S	10 pin socket to socket	2.00 + .20 per ft.
14S-14S	14 pin socket to socket	2.50 + .28 per ft.
16S-16S	16 pin socket to socket	2.75 + .32 per ft.
20S-20S	20 pin socket to socket	2.85 + .40 per ft.
26S-26S	26 pin socket to socket	3.50 + .52 per ft.
34S-34S	34 pin socket to socket	4.10 + .68 per ft.
40S-40S	40 pin socket to socket	4.50 + .80 per ft.
50S-50S	50 pin socket to socket	6.15 + 1.00 per ft.
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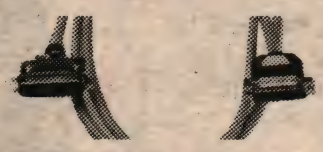
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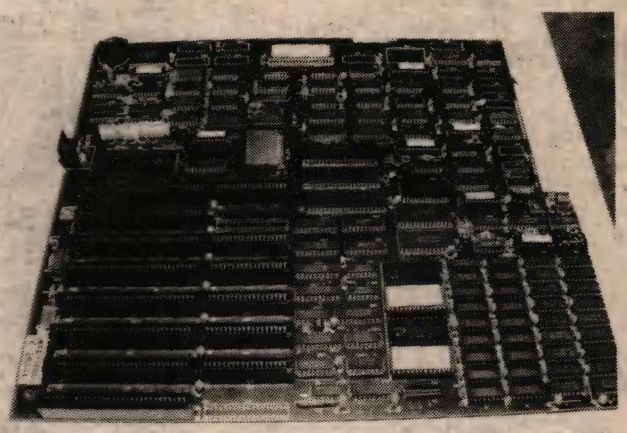
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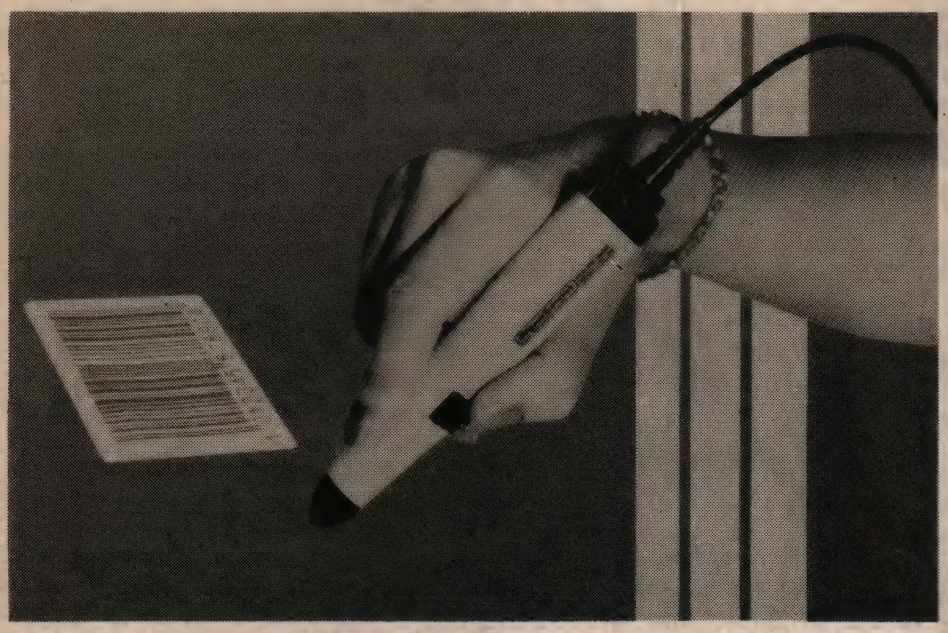
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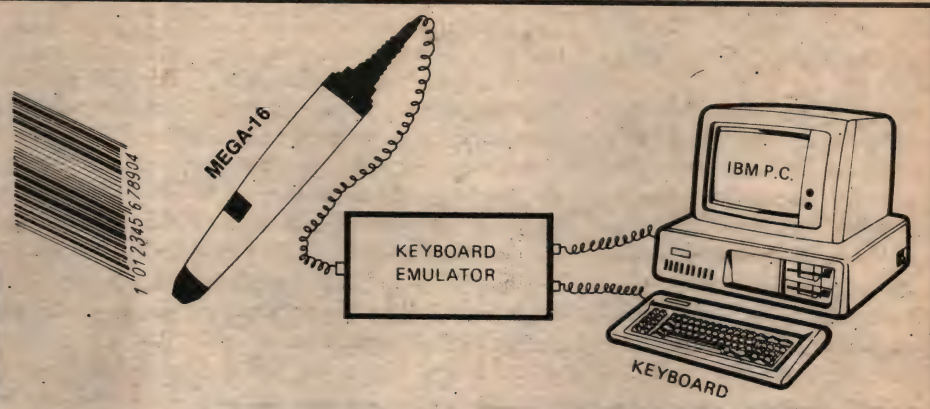
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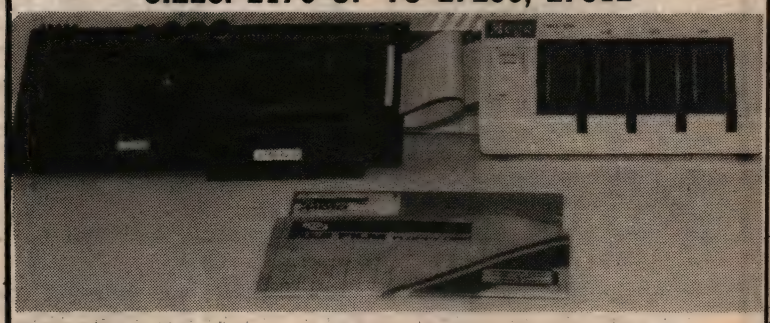
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Educational Software: Calculus And Algebra Programs

by Dr. Michael W. Ecker

Resource Software International publishes educational software of the drill-and-test variety at levels ranging from elementary school through early college. While its own promotional material uses terms such as "problem" and "exercise" interchangeably, in point of fact the material is strictly drill of routine exercises. This does not automatically mean that the material is not worthwhile, but the distinction ought to be made.

Before jumping in with details, let me cut to the heart of the question involved in a possible decision to purchase. On the one hand, I found that the software accomplishes its objective pretty well. Although there are a few things which are not as professional as they could be, for the most part the results are accurate, and the software has few bugs. This statement needs to be qualified by pointing out that the software does not really test all of calculus, or all of algebra. In fact, it only deals with routine calculations. I estimate that each package deals with only 10%-15% of the course for which the package is designed to be an aid. Moreover — and this is the other aspect — there is a real question of whether software such as this even serves a real function at all. Please read on for details...

Let me take the calculus program. The review copy I received contained a compiled program which loaded easily enough according to directions. My little manual of about a half dozen pages contained special tips for teachers, but to the credit of the package, even this small manual is hardly needed. You load the program from DOS Ready (the A> prompt) by typing CAI40 for the calculus program (CAI43 for the algebra package). A title loads, then a menu of a few choices. You can route output to the screen or the printer. I found the printer option a nice excuse for somebody to buy this package: In effect, you can generate test questions of the multiple choice variety using it. (I personally never give *my* students such tests, but that's another story. You also have to be lucky enough to have occasion to give a test on precisely the limited topics covered by the package.) There is a pretest of five questions which you may take first. In each case, the computer asks a question.

In Volume 1 of the calculus package, routine differentiations are asked. Four choices are given. You do all your work elsewhere — on paper, in your head, whatever; anything but with the computer! Then you enter the number (1 to 4) of the choice corresponding to the correct answer. I found this part accurate, and some of the "distractors" — that is, wrong answers — are well chosen to defy easy guessing. In other instances, I found I could inspect the answers and pick out the correct one easily enough. Of course, I have a PhD in mathematics and am a university professor of same, so RSI might argue that this is not representative of what the student can do. Okay, let's not hold that against the company.

As I implied before, I have pedagogical reasons for never using multiple choice format for tests, so I think that this makes this software limited. In fairness, writing software otherwise is quite difficult, and I can offer no easy alternative. Perhaps the technology for really useful educational software is not fully developed even. But this point still remains valid.

In Volume 2, routine integrations are tested. By this I mean that the user is asked to find indefinite integrals of functions which are of several clearly defined classes. I found most to be exercises in the general power rule for integration, some trigonometric integrals, sums and differences, and polynomials in particular for the integrand (function being integrated). Occasional products which lead to sums of terms integrable by the power rule also appeared. The $64,000 question of how to indicate integration was handled easily enough by RSI; it simply wrote "The integral of (then the function of x) dx."

The terminology used was less than professional in several

continued on page 92

Canon's Transportable continued from page 53

A-200 Transportable Specifications

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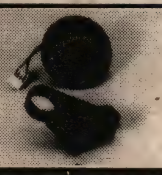




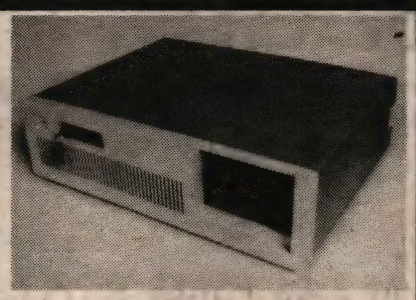
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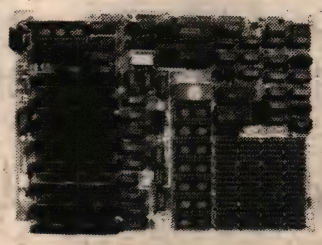


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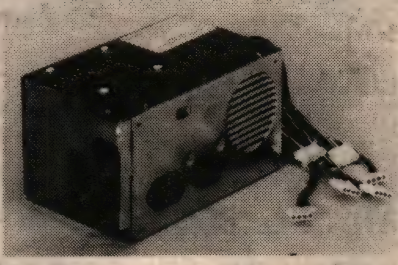
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Turbo GameWorks continued from page 53

be fair, I'm a relative Pascal beginner, and a more experienced Pascal programmer could take advantage of the well-commented code and structure of Pascal to know what he or she was doing.

As a tribute to the programming, I must say that I did not read much more than the first couple of pages of the book-manual and yet I had no difficulty in playing chess. I did fool around and hit the Break key and discover that this forced a return to DOS, so I decided not to do that again. But otherwise, everything was handled beautifully, and I was all set to play chess. The only thing that I can say negative about this game is that; I almost beat it. (Sort of like the old quip about not wanting to join any club that would have me as a member!) I say "almost" as I asked the program for hints and took back a couple of bad moves; I would have lost otherwise. I used the default modes and level of play, so perhaps that had something to do with it too. Still, I was surprised that the program allowed me to get my white pawn to the opposite side and thus convert it to a queen (automatically). Black promptly resigned. After playing a mediocre game, I could not believe I had won, or maybe I should say that I could not believe that White, partially aided by Black, had won. I note that the chess portion of the blurb on the back of the book's cover emphasized the ability to edit to strengthen the program and thus your own play, as opposed to arguing or claiming that the existing compiled program was already a complete, eternal product which would never be touched again. Thus, while the program played a respectable game of chess, nobody seems to be arguing that the package included the next computer chess champion.

Some of the nice features of the chess program include the take-back feature, invoked by pressing B (for Back), and asking computer help, H (for Hint). The display and layout of the board and menu are attractive, with messages such as computer evaluation displayed--computer thinking processes were more like flashed than displayed--to the right of the board. I liked the easy manner of moving pieces via the arrow keys, with the space bar to indicate selection, or keyboard input such as E2E4 meaning the expected opening move of King's pawn two spaces forward; that is, move from E2 to E4. The pieces do not utilize the most sophisticated artistry possible, although I was satisfied that all were sufficiently distinct and identifiable; all have a letter as part of them, such as "P" for pawn. I was initially surprised at what I thought was a spelling error in seeing "N" for knight until I realized that "K" had already been used for King. With an editor, I could set up games (although I have not yet tried this feature at review time), and the program itself allowed for saving of games upon exiting.

For those who have a color monitor, use it to enjoy the color graphics. I tested the program on both monochrome and color systems, including my Tandy 1000, PC-compatible and my Sanyo MBC 555 PC-semicompatible. Although Borland products work even on the semicompatibles, little things such as the colors don't quite work 100% right on the Sanyo, even if you do have the Sanyo Video Board. Of course, there is no problem with PCs or true compatibles.

The package itself is compatible with SideKick, Borland's pop-up background utility. I didn't really need to use it; I just wanted to see whether Borland was keeping consistency and compatibility within its own product family. Not just that, but some of the games had features reminiscent of SideKick's windows. For instance, take the bridge program. This program allows 1-3 players with various option combinations. In the middle of play, you can ask for the score. I was initially surprised to see the score pop up as a window over the screen.

Not having played too many computer bridge games, I was surprised by what I thought was its slowness. In fairness, we are speaking of a quarter of a minute to perhaps a minute for each computer player to make a play. This compares favorably with real world bridge play, but somehow I must have gotten spoiled, not just by computers in general, but by another bridge program which always moved almost instantaneously and also provided me with the best hand! After a look at some other bridge games, I'll be able to assess the question of speed more capably.

Summary

Although I could recite the other features, and perhaps say a few words about Go-Moku, I think the point becomes one of returning to the philosophy behind the product. You can look at it as a mixture of these two: 1) Turbo GameWorks is a package of well constructed games, ready to run and enjoy at a competitive price. 2) Turbo GameWorks is a package for study of the programming techniques in Pascal for the creation of games, with the ability to edit and compile to create a custom product. How you utilize this mixture is up to you. Neither Borland nor I swear that the existing compiled, ready-to-run programs are necessarily world champions as they stand, but I found them respectable and competitive with existing computer products. When time allows, I intend to have some of my other chess programs, such as Rapidynamics Software's Chess (for TRS-80), Software Toolworks' MyChess (for MSDOS), and others, play aginst Turbo, as well as aginst each other. The outcome should prove interesting.

Nevertheless, best or not, the programs were delightful to play and I found no bugs. In fact, I thus far haven't even found any spelling errors (something which I can't say for earlier Borland releases, such as the MicroCalc spreadsheet included with Turbo Pascal 1 and 2; haven't checked 3 yet). If you are interested in adding some games or in learning about their creation, this is for you. If you have a more serious interest in modi-

continued on page 92

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To install, connect any standard Centronics Parallel Cable directly to the switch and connect the switch cables to each printer. The Printer Switch will redirect four signal connections to your chosen device. You can even use your existing cable so no extra cables may be required.

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Two 3½ Foot Printer Cables Included.

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Same as above for SERIAL Devices. DB-25 Pin connectors and Null Modem Option on Channel B!

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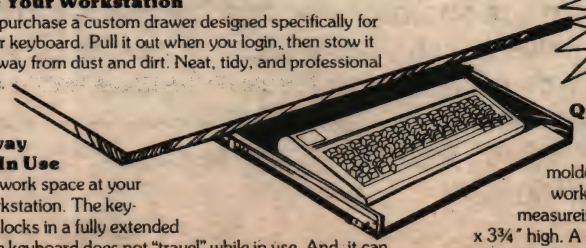
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Free valuable work space at your computer workstation. The keyboard drawer locks in a fully extended position to the keyboard does not "travel" while in use. And, it can be adjusted to three heights for different users. Once you're done, simply slide it away and out of sight.

Quality Construction & Smart Design
Built of strong steel and molded plastic, this drawer can work effectively with keyboard measureing 20½" wide x 10" deep x 3¾" high. A smart accessory to add to your crowded workstation. Measure your keyboard and see if this drawer will work for you.





U.S/DISK U.S/DISK U.S/DISK

ISHVAR

ISHVAR Technology

********* NOTICE: *********

AVATAR Systems has changed its name to *ISHVAR Technology* so that our customers will not confuse us with Avatar Technologies, Inc. We have also moved and our new address and new phone number can be found at the bottom of the page.

****

Three systems to choose:

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IBM PC/XT Standard compatibility. 256K RAM xpandbl to 640K, 135 Watt.

-Starter Kit	Bare-bones no drive or controller	$ 465
-The Home PC	Complete w/disk drive & TTL Amber monitor	$ 799

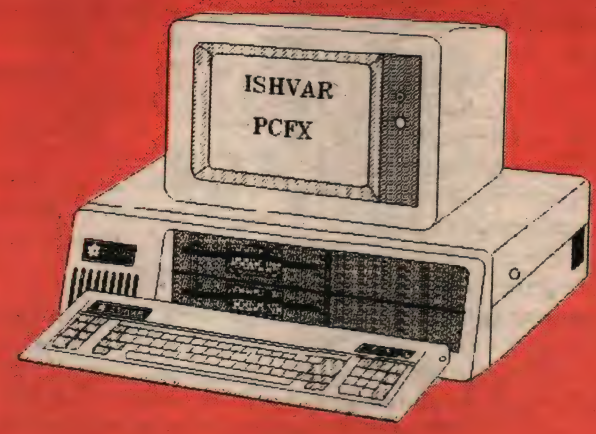
We configure to your specifications.
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IBM PC/XT FAST compatibility. PCFX has 4.77 & 7.34 mhz clock.
55% Faster then IBM. Full 640K RAM on board.

-Business PC	w/2 drives & TTL Amber Mon. w/Par Port	$1085
-Business RGB PC	w/2 drives & 14" RGB Color Mon. w/Par	$1360
-Business PCX	w/1 Drv, TTL Ambr Mon, 20meg H-Disk	$1485

Tell us how you want your PC configured.
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DOS available separately.



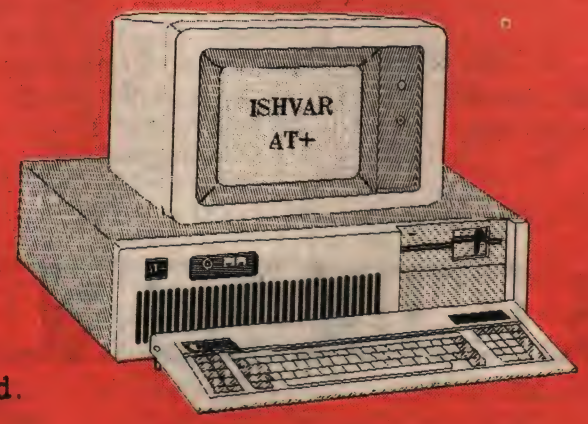
AT+

IBM AT compatible. 512K RAM standard on board.
Serial / Parallel ports included.

-Basic AT+	w/1 1.2 meg Drive	$1975
-Professional AT+	w/1 1.2 meg Drives, TTL Amber Mon.& card	$2195
-ProEnhanced AT+	w/1 1.2m Drv TTL Ambr & 20m (85ms) HD	$2580
-Enhanced AT+	w/1 1.2m Drv TTL Ambr & 20m (32ms) HD	$2845
-Enhanced+ AT+	w/1 1.2m Drv, 1024K RAM, 30m 32ms HD	$3295

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DOS vs 3.10 & TEXTRA Word-procssr or disk Basic, + other freeware included.
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Citizen MSP-10	160 cps Dot-Matrix	$ 255*
Citizen MSP-15	160 cps Dot-Matrix	$ 355
Citizen MSP-20	200 cps Dot-Matrix	$ 340
Citizen Premier-35	35 cps Daisy-wheel (NEW) (inclds tractr)	$ 450
OkiData Okimate 20	Color Prntr w/IBM print kit	$ 209
Juki 6300	40 cps Daisy-wheel	$ 665
Parallel printer cable (length = 6 foot)		$ 012
LePrint Software standard package w/5 type styles		$ 140*

* Over 90% of this ad has been type-set & printed using the LePrint software and a Citizen MSP-10 printer on the PCFX. (Copy was reduced slightly)

Monitors:

12" TTL Amber w/built-in swivel base	$ 120
14" TTL Amber w/built-in swivel base/TTL or RGB input	$ 175
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Portable: 640K, 1 drv, 20 Meg HD & 20 Meg Tape	$2995
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* For affordable and Easy LAN systems use the AT+ or FX as the file-server and FX or SX computers as work-stations and Link them with EasyLAN. Use with modems to link stations at home or remote offices.

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Framework II

continued from page 54

future, and every programmer is following with all deliberate speed. SYMPHONY, based on the concept of the spreadsheet, was the best of an older school of programming. Its function windows are rigid and awkward to invoke. They do not cascade onto the screen effortlessly as they do in FWII. Symphony 1.1 has added a dynamic outlining facility as an "Ad In," but it remains an external facility, static like a pre-computer outline.

In FWII dynamic outlining is the web that ties together all the applications. It provides a structured outline, automatically numbered and renumbered as it is edited, with virtually infinite nested levels. Each line in the outline represents a frame, and each frame can be formatted, manipulated, moved in whole or part, as the user wishes, both from within the frame, or more simply by moving a label on the outline.

Any part can be expanded or collapsed at will, and unlimited windowing allows the frames to be viewed on the screen, dragged around, changed in size, or overlaid, so that instantaneous and simultaneous editing is possible. There are no limits on block editing and moves among the frames; any part of any text, from a word to the whole, can be marked and moved anywhere. Text can be readily copied from database or word processing frames into larger documents. In addition, the multiple perspectives of the outline itself, at any level, can be projected on the screen, by heading or by number, and if desired, shown as a set of smaller frames, as a jog to the author's memory.

The great advantage of dynamic outlining is perspective, permitting the user to see a work-in-progress as a whole made up of structured parts. Ability to collapse or expand at any point provides direct means to grasp an emerging totality and to impress upon each part the architecture of the whole. "A place for each part and each part in its place." The process facilitates continuous feedback of the developing work upon the processes of thought.

The outline is an integral part of the document it organizes, in a physical as well as a conceptual sense. If you change either the outline or the frames, the other will change accordingly. If one re-names a frame, the corresponding item in the outline is also changed. If one re-arranges the items in the outline, the framed parts of the document are also rearranged. One can put together a report of many disparate parts simply by arranging the frame titles in the outline, and then printing the whole.

Robert Carr and company have managed to strengthen an already strong entry in the integration sweepstakes. In addition to the truly significant conceptual leaps of extended memory and sparse-cell storage, many minor faults have been removed. The communications module is now native and not patched-in, the documentation is mostly clear and concise, an 80,000 dictionary and speller, capable of user customizing, has been added which runs not only on text, but also on databases and spreadsheets. Labels and mail-merge are now much easier to operate.

Now it is possible to display hard and soft page breaks with page numbers, a failing much-criticized in earlier releases.

The telecommunications module now freely exchanges data with the word processing and spreadsheet functions, operating in the background while the user is busy working on other data.

The database and spreadsheet have received special attention and have been brought fully up to heavy duty standards. Data can be viewed, like Borland's REFLEX, from a variety of vantages, and is fully relational. Spreadsheet size and speed tests confirmed Ashton-Tate's claimes; a FW file was reduced to half the number of bytes after conversion to FWII, and recalculated, after a few changes, in almost half the time.

Because of its central concept, FWII is amazingly simple to learn and to use. I have been able to launch users (who had previous experience on other spreadsheets and word processors) after about 15 minutes of instruction. All I needed to do is clarify the central concept, creating frames and jumping in and out of them. New users were quickly able to go it on their own.

The new release greatly simplifies printing and formatting text files. Early versions required users to insert FRED formulas on text frames in order to override default parameters (such as spacing, page numbering, etc.) Now the printing menu leads to a sub menu of options, allowing the user to select all parameters by pointer, including setting-up the printer for emphasized or compressed fonts.

Greatly improved is the installation routine. Earlier versions contained a CONFIG.FW file. The user brought this up within the program and changed the parameters by reading and editing the text. This tended to be technical and complex, with the necessity to enter a variety of arcane numbers, raising numerous ambiguities for neophytes. FWII provides a SETUP disk. A series of interactive menus leads the user in ordinary English through all the technicalities. And more aspects of the program can now be customized than were possible before.

We have neglected FWII's graphics capabilities. These are superb! All the usual charts can be generated automatically from a simple and clear menu, and redrawn when data is changed just as easily. Multiple graphs of any size can be displayed in full color simultaneously on the screen, or inserted into text documents.

Opening a DOS window within the program has been simplified. Now a full-screen frame is created automatically, saving several keystrokes and micro-seconds. A record of all the DOS steps can be saved to a file if needed for later use or for teaching purposes.

Of course, FW's original virtues have been preserved:

- Speed in loading and writing files.
- The elegant logic, consistency, and simplicity of its pull-down menus and command structure, which makes it easy

continued on page 96

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Disk drives MUST be periodically cleaned and lubricated, and repaired as needed. Malfunctions can be devastating in lost programs, data and text; loss of business; upset customers; down time. YOU can maintain, troubleshoot, and repair drives WITHOUT EXPENSIVE OR DELICATE EQUIPMENT OR DIAGNOSTIC SOFTWARE - often in situ and in less time than it takes you to remove, pack, ship, receive, unpack, re-install, re-configure, and retest drives sent to drive repair shops!! Shipping drives is risky! If you want the job done right, on time, and at minimal expense - DO IT YOURSELF! OVER 100 LABELED PHOTOS AND ILLUSTRATIONS OF STANDARD-BUS 5.25", 8" AND MICROFLOPPY DRIVES, AND SPECIAL DRIVES (APPLE, COMMODORE, SONY)!!:

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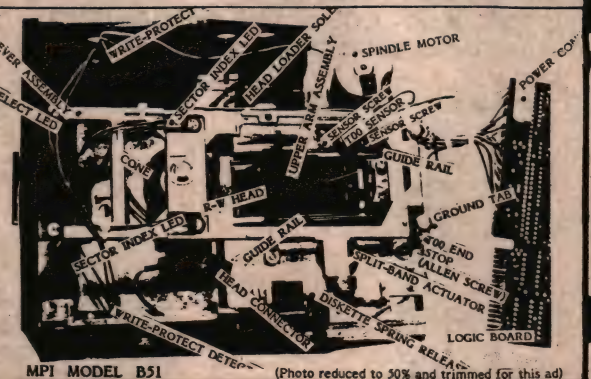
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MPI MODEL B51 (Photo reduced to 50% and trimmed for this ad)

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In 1980, PRIME TIME SATURDAY (NBC) aired "POWER TO HEAL," describing electrical and magnetic devices that accelerate tissue healing, and promote good health and growth in plants, animals and man. New medical and dental applications are being discovered. The FDA approves the clinical use of three versions of these near-miraculous healing devices. Yet, few know about them.

Designs, operation, installation and uses completely described and illustrated - circuit diagrams, voltages, currents, frequencies and waveforms. How these devices result in healing success rates of 80% to 90%!. These devices are leased by commercial manufacturers to physicians for $2,000 each per application. You can build them for about $50 each!

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- Circuit diagrams of X-SWITCHERS. Independently switch one/two printers or plotters to one/two computers without disconnecting either. Schematics of Centronics Parallel, RS-232C and 20 ma Current Loop.
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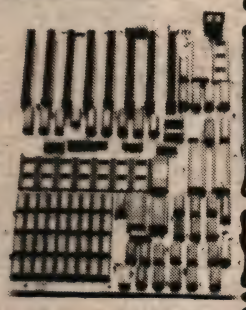
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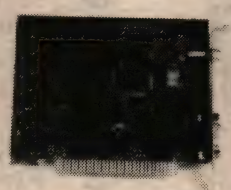
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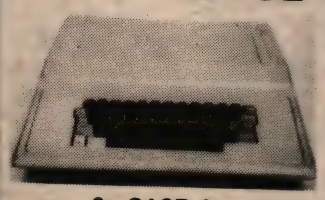
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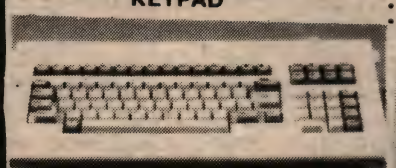
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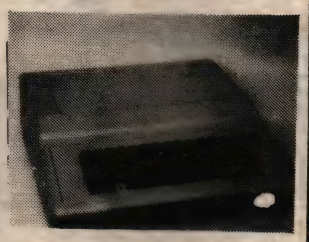


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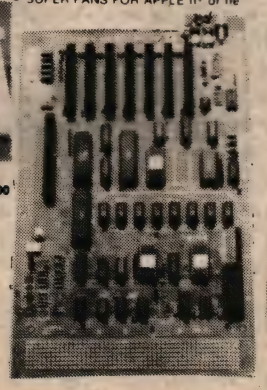
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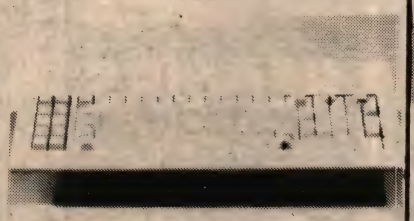
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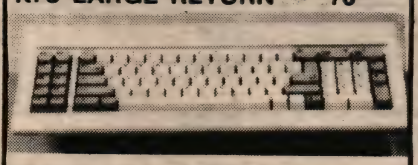
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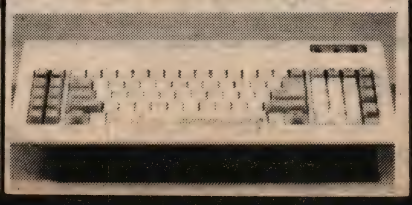
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Turbo GameWorks
continued from page 87

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Gin!

Pontefract System's advertises its gin game with the pitch that it is geared towards the frenzied executive. In fact, it uses those words: The perfect gift for the frenzied executive. Considering the twenty-year management and systems background of the man behind the company, J. Baldwin Pontefract, one gets the distinct impression that he himself might have been such a frenzied executive.

Speculation aside, Gin! is a very nice computer adaptation of the classic card game. One of the things which attracted me to the game is not having seen one for computers, although I vaguely recall seeing either Artworx or Dynacomp offer such programs, particularly for TRS-80s and/or Apples or other home computers. One interesting feature is that the instructions are summarized on the Tyvek sleeve. That's right, I said *on* the sleeve, not in the sleeve. (Lots of small companies do the latter.) As for the instructions, those are available on a file on the disk, which comes packed in an attractive disk-sized case.

continued on page 97

Educational Software
continued from page 86

places in both packages. In the calculus package, one question tests implict differentiation; it doesn't say that, but any calculus professor will recognize it immediately. It goes like: "Find the dy/dx of xy = 4." This is the kind of terminological abuse that I get from beginning students, and which I correct. In the algebra package — and the calculus one, for that matter — there is continued misuse of the term "word problem" even though none of the drills could be classified as such. Of course, RSI does say it produces drills, but this and its reference to "Thinkers Exercises" strike me as misleading. Again, I don't think that there is much more that can be done, but at least what is being done should be properly identified.

As a generality, there is absolutely no facility for correcting errors. True, you can find out the correct answer was choice number 3, not choice number 2, but how does that help? If the student or user is fairly good, he may figure out his error, but for the most part, there is little reason to assume that he will.

The calculus module says it is for use in grades 8 through college. Somebody here has little contact with reality or else is being too general, since very few American students take calculus before college. While this is not heinous, it suggests a lack of expertise, familiarity or care in preparation of the manual or the materials. In view of the previously mentioned terminological abuses (and similar ones in the algebra package), this seemed consistent.

There is a small help file available with the press of the "?" key. Press "K" to go to the next screen, "I" for the previous screen. I first thought this a nice touch, but with only two screens (or pages), pressing the "K" key on the second page keeps loading the same screen, which seems a bit silly.

Although the packages were mostly accurate, I found some ambiguity, notably in the algebra pretest. When the question called for "the solution" to a given quadratic equation, I was glad that it accepted either of the possible two solutions, but bothered by the misleading suggestion that there might only be one correct answer. I also found that I could crash the system in the algebra program by input of an answer 2 in the form 2.00000; specifically, the screen froze, and I had to reboot the system.

Despite this recitation of pluses and minuses, the question remains of whether or not you should buy this even if you are taking such a course. Frankly, this software is not much more than page-turning on a computer screen. The computer's role is very limited in asking questions of certain types. Why was this software produced? How is the computer helping? Why not just look at a book? The education market is flooded with books which will do exercise testing no worse than this. True, the material is mostly accurate in its results, and it does supplement the courses in question to some extent. And true, the software is reasonably priced by most standards. But there hardly seems to be a suitable reason to produce this software. Hence, I would recommend these packages only if you have a real shortage of materials in your area, or need the artificial stimulation of a computer environment to do these routine drills. Considering how cut and dry they are, maybe that is a good reason!

Resource Software International, 330 New Brunswick Ave., Fords, NJ 08863. (201) 738-8500. Any Sanyo 550/555 or MSDOS machine; $34.95 per module.) ●

Word Finder A Computerized Thesaurus

Reviewed by Lon Andrews

200,000 synonyms for over 14,000 key words! That is a lot of synonyms for anyone. Writing Consultants' WORD FINDER is one of the writer's best friends. It is available for the IBM PCs and compatibles and integrates with WordStar, WordStar 2000, Multimate, Microsoft Word, Word Perfect, Pfs-Write, IBM Writing Assistant and Easy Writer II. There is a WordStar version available for CP/M. One dark spot on my cloud is that it will not integrate with the special releases of software distributed by Tandy. It will run on the 1000 but only on off-the-shelf software. This is a disappointment to me and raises the question as to why. No one at the levels of Tandy I deal with that could or would answer that question. I did find that the version of WORD being sold by Tandy is quite a bit removed from the current version on sale from Microsoft.

Meanwhile back at the computer, WORD FINDER is supplied on a data disk and incorporates a tricky little device in its installation procedure. It calls for your name and address and uses this data as part of a routine to generate your registration number. This number is supplied whenever WORD FINDER is loaded and is required in order to receive future updates. WORD FINDER is not copy protected and can be copied to hard disk or floppy. The balance of the installation procedure tailors the program to your word processor.

After running the installation procedure the first time it can only be re-run to change word processors. The registration number can not be changed once it is set and must be included on the warranty registration that is mailed to Writing Consultants.

WORD FINDER can be loaded from a disk drive and any directory that you desire. In a two drive system it is suggested that the essential WF files be placed on the working copy of the word processor in Drive A leaving Drive B free for your data disk. This will require removing non essential files from the word processor disk. You can also load the WF files from a data disk before loading your word processor. Once WF is memory resident you can load the word processor. If you are using a hard disk you must specify a path so that WORD FINDER can find the file. This is done when you load WORD FINDER or the program can be customized to include this data using the ENHANCE program.

Once WF is loaded and your word processor is running all you have to do is place the cursor on the word that you want a synonym for and use the required command key. This key(s) will vary from word processor to word processor. Most of them seem to use CONTROL F6. WORD FINDER opens a window that includes a list of synonyms for the word indicated by the cursor. Using the cursor control highlight the selected synonym and hit ENTER. The word is automatically replaced with the selected synonym.

If WF can't find the word you indicated with the cursor it will display thirty of the words it finds that match the closest. If you want a synonym for one of these words mark it with the cursor and hit ENTER. The synonyms will be displayed.

There are several other areas of interest about WORD FINDER. It can be run alone without a word processor if you desire. Load the program and from DOS type the word you want to find the synonyms for and hit the command keys. The window will open just as if the word processor were being used. The program can be customized to change the command keys and modify the opening screen to indicate the change in command keys.

The documentation is 30 pages (5"x7½" with large print) long and well written. I

continued on page 96

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Amiga, Atari 520, IBM PC Kaypro, Osborne, RS, Sanyo	Cable	$209/$289/$399	$285	$235/$269/$349	$249
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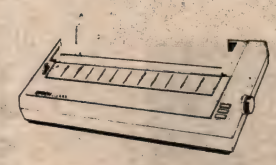
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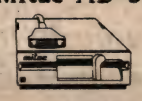
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Uniform Software Cross-Formats Disks

Reviewed by Lon Andrews

Use a TRS 80 Model 4 data disk on my Model 1000? Who are they kidding? The answer is simple. They aren't kidding anyone--they are serious. MicroSolutions' *Uniform* program will turn your IBM or compatible into more than seventy different formats.

Due to the large number of business oriented 5¼" disk operated CP/M machines located in industry there exists a tremendous compatibility problem. I did some checking and found in one business three different CP/M machines, each using a different disk format so the data disks can't be swapped without a lot of trouble, if then. As the technology advances new and different types of machines are purchased for different applications throughout a company. You end up with different departments using systems all their own with software that is not usable in other areas due to incompatibility. This results in data that cannot be used from machine to machine.

Uniform allows you to reformat disks so that the data can be used from machine to machine. Obviously it will not rewrite programs to run on machines that they would not normally run on and it does nothing to the data itself except move it around. There are some formats that are not capable of being worked with by *Uniform* and some that will be read only.

The same programs (word processor, data bases and spread sheets) are used by many of the CP/M machines. The data files from these programs are compatible but the diskette formats are not so their data is not accessible. By changing the diskette format with *Uniform* you can wok with the data on the IBM PC or compatible that was created on another CP/M computer.

Uniform is supplied on a nonprotected data disk. There is an installation procedure on the disk. The process is so simple that I thought for sure that it must be wrong. In short order the program was installed and ready to run. When you run *Uniform* the program asks several questions about your system. Then the first of four menus is presented. These four menus list all the various formats available for reconfiguration of your drive. Once the format is selected you are informed that Drive C is set to whatever format selected. The drive is then addressable as if it was in the machine indicated.

The first time I used *Uniform* I was convinced that I had a problem. The program informed me that "Drive C" was to be the converted drive and I had visions of losing data. At the time I was running *Uniform* my hard drive was out of commission so I wasn't worried about losing anything at the time but it would be a problem when the drive was re-installed. I stopped and re-read the docs and still wasn't sure what was happening. Time to use the telephone. I soon found out that I had overlooked something simple. A READ.ME file on the disk. Not to worry. It was all in the semantics. The last available floppy takes on two identities. Just like Superman.

With a two drive system once the *Uniform* program has re-configured the drive in the format you request through the menu you have, in essence, three drives. The first drive is still A, the second drive is B for normal DOS diskette access and if you want to access a CP/M diskette it is addressed as C. With a single drive system the drive becomes A and B.

This is different than using a utility to copy a file from one format to another. *Uniform* causes your machine to act as if the drive were in the other type of machine so the data file is directly accessible. You can take a disk created on machine "X" put it in your MS-DOS

continued on page 103

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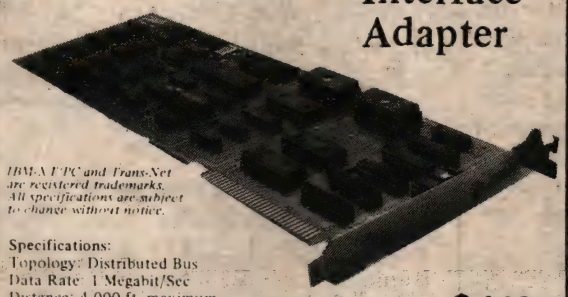
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Framework II
continued from page 90

to learn and use, and minimizes keystrokes.

- On-screen formatting and rapid re-formatting, including automatic paragraph indentation, rapid margin changes, from justified/ragged right.
- Multiple formats in the same document, merely by marking blocks of text and re-defining the format, while the rest of the text is controlled by a general format or by the defaults; and multiple line-spacing by imbedding formulae in multiple frames and linking them in the same document.
- Ability to import and export data and text in a wide variety of formats. The formats provided in the initial release are: ASCII, IBM DCA/DisplayWriter, WordStar, Multimate, dBaseII and III, Lotus 1-2-3, and all spreadsheets that use the VisiCalc DIF format. Menu space if provided for adding other formats, which are expected to be released soon. Conversion to and from WS2000 can be done by using FWII to convert to WS, and then using WS2000's own conversion utility to complete the job.
- Ability to show underlined, boldface, and italics on the screen just as it will be printed.
- Windowing to DOS, to enable the user to give DOS commands, or to load some other program, without exiting from the active FWII program.
- Unlimited windowing allows the frames to be viewed on the screen, dragged around, changed in size, or overlaid, so that instantaneous and simultaneous editing is possible. In the earlier releases, each frame's maximum was 32K. In FWII, the buffer size for individual frames is increased to 66K. This is still somewhat of an inconvenience even though multiple frames can be linked together for editing or printing.
- Users can not only write their own macros, but can create their own pull-down menus and invoke them by a pointing cursor bar.

Better Fred Than Dead

FWII, like its earlier versions, offers a comprehensive built-in programming language, dubbed FRED (for frame editor). An interpreter that must be run from within FW, it goes well beyond the cell formula and macro capabilities of 1-2-3. Once the user learns the relatively simple syntax of writing macros or cell formulas on a FW spreadsheet, he can branch out into writing all kinds of programs to perform ancillary functions: setting up complete bookkeeping, payroll, billing systems to run large or small businesses, introducing graphics, audio, animation, performing sophisticated statistical operations, survey research, etc.

FWII has added an automatic LIBRARY "cabinet" which loads and saves all macros, abbreviations, key filters, and document templates at the beginning and end of every work session. It is always on the desk top and its contents may be accessed at any time from its own directory. It comes with a dozen or so sample items ready to go, including forms for business letters and legal documents, control codes to switch printing fonts, macros that report available memory, display a phone book window, type at cursor current date and time, etc.

As with dBaseII, Ashton-Tate again show its propensity to offer software that is completely open-ended. FRED offers to average people, who become dedicated FW users, a next step into the world of customized programming.

Limitations of Program

We should be candid about FWI's shortcomings. Here are the most important:

- Absence of many standard word processing features which users now take for granted, like simple upper and lower case conversions, automatic endnote/footnote formatting and numbering, cursor movements to end of words, ends of paragraphs, etc. FWII has added soft hyphens, now an obligatory function.
- The bothersome habit, when importing ASCII text files, of breaking them into short chunks of 8-10K each nested into multiple sub-frames. In scanning or editing them one is obliged continually "to jump in and out" of frames. In addition, the importing utility interprets line breaks in the file as "hard" thereby scrambling attempts to reformat the line lengths and paragraph indents.
- The absence of built-in font styles other than boldface, italics, and underlining. All other fonts, such as compressed, expanded, enhanced, elite, strikeovers, etc., must be added to the program with user-made macros, or can be embedded in the text by means of Alt-ASCII decimal numbers. This is a complex

continued on page 100

Word Finder
continued from page 93

appreciate the large print as it makes my job easier with the glasses I wear on my nose. There isn't much that you need to document. They do list possible errors and individual quirks dealing with some specific word processors.

The program loads and runs as advertised. I like it as I do a lot of writing and sometimes you just run out of words. The Thesaurus helps in some of those blank spots when nothing else will help. By the time this is published the latest version will be on the market. The first version that I received included 90,000 words for some 9,000 + key words. While talking to Writing Consultants about the integration with Tandy released software I found that a newer version was underway. They sent me Beta Version 3.01 with over 200,000 synonyms for over 14,000 key words. It still has some errors in spellings and some misplaced words but it is beautiful.

The 3.01 version has a multi level lookup that lets you go as deep in to the Thesaurus as you want. Synonyms of synonyms if you please! If you write, you need WORD FINDER!

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Turbo GameWorks
continued from page 92

I was surprised to see the options available there--Hollywood and Oklahoma--as well as the rules being more subtle than I had remembered, although my own recollection from childhood was close enough to allow play after just the scantiest of looks at the directions. The directions are quite complete, but I would recommend printing them out for easy convenience if not all the rules are that familiar to you.

For the benefit of those who need an introduction or a refresher, you and your opponent each get 10 cards. A card from the deck is turned up. The first player may take either it, or else take the top card for the deck, the deck being face down. Then that player discards a card face up onto the discard pile, the pile with the face-up cards. In turn, the next player may take the top card from that pile or from the deck. The object, roughly speaking, is to obtain appropriate groups of cards, each of which group consists of at least three of either all the same kind (e.g., all fives, or all kings, etc.), or a sequence in one suit (e.g. 4,5,6 of spades). There are options for ending in other ways (i.e. "knocking"), but you have gin when you have groups of three or more and just one discard left at the end of your turn.

The computer plays a gentlemanly (ladylike?) opponent. It always pauses to point out when it is taking one of your discards, never continuing until you acknowledge it. You never have to wait for it to move either. Then again, one would think the decision process is much simpler, so why should there be a wait?

The graphics, as you would expect, are nicely done, as is the screen layout. Nothing overly involved, either. The program ran fine on my Tandy 1000, but froze on my Sanyo 555 after one to two minutes, both in the usual mode as well as with the Video Board. (In view of the graphics, this may not be so surprising, since graphics are the #1 culprit behind problems for that computer).

Upon opening, there is a menu of options, including play, set program options, print documentation, view documentation (i.e., read rules), and exit to DOS. I decided to play. Next I was asked whether I wished to play Hollywood or Oklahoma. These options deal with the knock value being determined by the first card turned up (Hollywood), and three simultaneous games (Oklahoma). I played Hollywood for a few games, going about 60-40 with the computer ahead on wins. I found that the program would not let me crash it or goof up intentionally or accidentally); I got a beep if I touched an inappropriate key (something I eventually get to do for each review). The funciton keys serve administrative functions such as help, rules, scores, use of keys, view of hand, new hand, gin or knock, exit. Escape usually undoes any mistake in claiming a gin or knock. To take a card, you use the Insert/+ key; to discard, use the Delete/- key.

Summary

Pontefract System's Gin! is indeed a nice implementation of gin for a PC, for all the reasons I stated here. While I personally am not really a gin player, objectively speaking, I would have to say that the claims are on the money for this product, particularly in its pitch "perfect gift for the frenzied executive"--except that you need be neither frenzied nor an executive to enjoy it. You don't even need to be an executive to afford it at $34.95. If you enjoy the game of gin and don't own one for your PC/compatible, I would recommend this one on the basis of its features and the pleasure it offers.

As for me, I'm going back to beat that program so as to get my win ratio back to at least 50:50...

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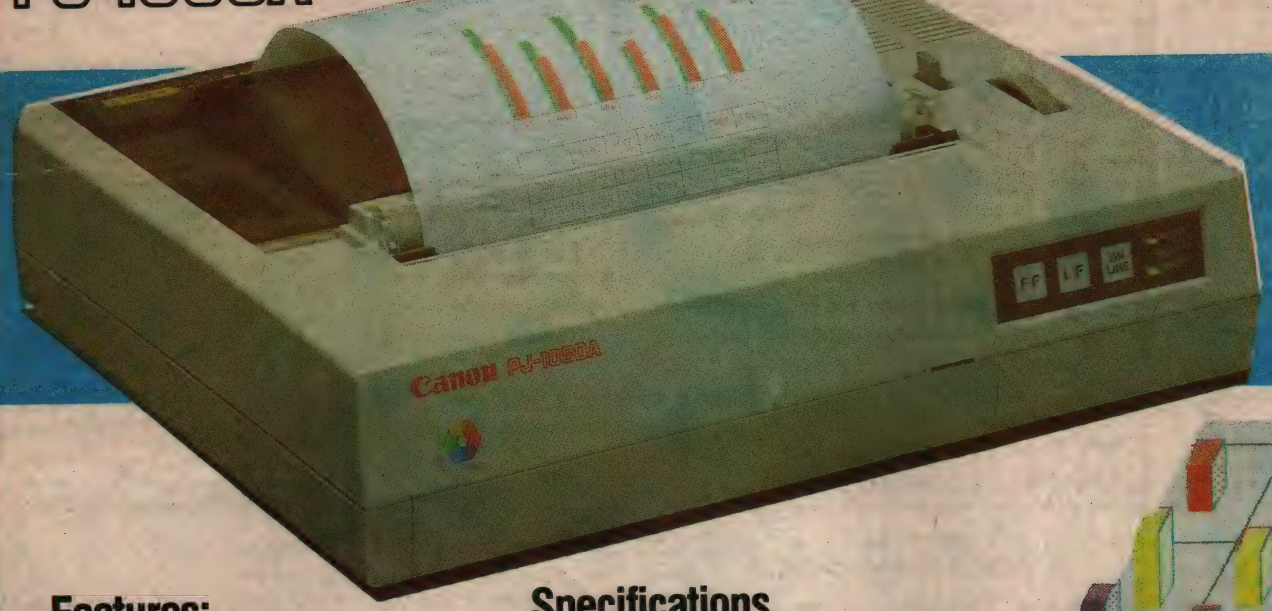
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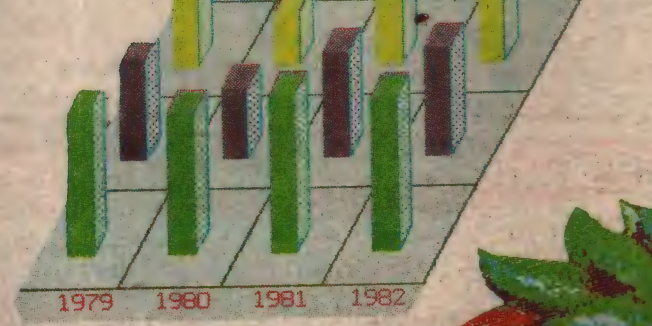


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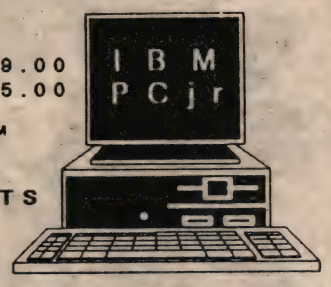
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Inexpensive New Device Enables Any Monitor To Plug Into PC Power Supply

When IBM designed the PC, it gave the power supply two sockets, one for the computer, the other for a monitor.

With this facility, the monitor would go on and off with the computer. A handy feature.

The monitor socket, however, was made so very few monitor plugs would fit. IBM's monitor certainly, and a few others, but not many.

As a result, most owners of monitors not compatible with the PC socket must plug into a wall socket or extension. Not as convenient, because one must then remember to turn off the computer as well as the monitor.

It's a minor but nontheless persistent source of irritation to many owners. One of those small but often overlooked problems that begs solution.

To compound the enigma, when made-in-Taiwan power supplies began arriving on these shores -- you guessed it, same funny monitor plug as the IBM. Hardly any monitor plug fits them either.



Monitor Adapter Power Cable

Magnetic Memory Corp. of Berkeley, CA, a multi-line marketer of PC-compatible equipment, has an answer and for a few bucks cost it seems worth the convenience. It's an adaptor.

One end plugs into the monitor socket. At the other end of the short cable is a standard, grounded socket. Plug your monitor into it and, voila, just like IBM.

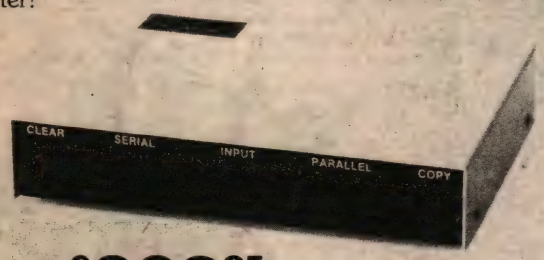
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Frameworks II
continued from page 96

process (holding down the Alt key, while typing the decimal numbers of the ASCII code on the numeric pad), probably beyond many users' wont, a reckless oversight. The lack of any support for footnoting denies to FWII a very large potential base, the academic users. The latter are a valuable resource for such an ambitious program because they open up the universe of college students, tomorrow's marketplace.

- While FWII can import and export most other Aston-Tate products, FWII files are not downwards compatible. That is, old FRAMEWORK files will load on the new release, but once saved, they will not thereafter be readable by older versions of the program. This means that a business firm will not be able to run different versions of FRAMEWORK side-by-side. Instead, they must upgrade all or none! A very great sacrifice of their past investment and a dirty trick played upon them by the company! Of course, they can be exported as DOS files, which will load into earlier releases; but, as noted above, they will be broken into small frames and will not readily re-format.

- FWII depends upon certain features of the IBM ROM-BIOS to run. Therefore, the company guarantees it only on "100% compatible" non-IBM equipment. It runs fine on Compaq and Corona, and probably on many others. However, it failed to run on several generic XT clones that I tried. Neither the popular Turbo-PC (from PC Limited), nor the XT-Plus (from American Micro Technology) would run the program. The message appeared: "Will not run on this machine!" If you have a compatible, I recommend that you try FWII before you buy it. Older versions of FW do run nicely on every generic that I tried. It did run on a Leading Edge/Sperry and a Zenith quite well.

- The System 1 Disk, the key to booting the program, is copy protected by the SuperLok system. It is a good protection scheme, since no copying program I tried succeeding in making a working copy. A backup disk comes with the package, to ease some of the anxiety, and a hard disk loading routine is supplied. If you need to move the installation back to floppy

continued on page 101

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DEST Introduces Low-Cost Page Scanner For IBM Personal Computers

DEST Corp. introduced PC Scan, a low-cost compact page scanner that automatically transfers information from paper into IBM Personal Computers and compatibles. The company also announced Text Pac, a character recognition software package for PC Scan that allows users to quickly enter text into popular word-processing programs.

PC Scan is designed to support a variety of other personal computer applications, such as electronic filing and image processing, as future software packages are made available.

PC Scan with Text Pac character recognition software automatically enters text into the formats of personal computer word-processing programs, such as MultiMate and WordStar. Tabs, centers, underscores, end of page, and document codes are inserted as if the document were produced on a keyboard. Text Pac contains type style and recognition information that enables PC Scan to read all common business documents. The software can process information at a rate of twenty-five seconds per page.

To activate PC Scan, the user inserts the page to be scanned, then types a single command while running the word-processing software. PC Scan transfers text directly to the computer screen and into the document being created as though it were being typed from the keyboard. There is no need to load software and no communications hardware or software is required.

PC Peripheral

PC Scan acts as a peripheral to the IBM PC, PC XT, PC AT, and compatibles. Unlike other scanners in its price range, PC Scan works automatically, making it easy to use and requiring no operator training.

PC Scan measures 4"x 11.5" x 16". It can fit under a small disk drive, printer, or terminal, and takes up no additional desk space. The compact unit weighs about seventeen pounds.

The scanner automatically scans one sheet at a time. Pages placed right side up emerge face down to maintain the correct sequence for multiple-page documents. An automatic video thresholding feature adjusts the scanning contrast to accommodate varying paper colors.

The unit accepts paper weights ranging from sixteen pounds to thirty pounds and sizes that vary from 6"x 6" to 8-1/2"x 14".

In the PC Scan, DEST has combined an advanced character recognition processor and image capturing capability. The system scans at a high resolution of 300 dots per inch and communicates to the personal computer through an industry-standard small-computer system interface (SCSI).

Price and Availability

PC Scan costs $1,995; Text Pac is priced at $595. All products are available thirty days after the order has been received.

For further information, contact DEST Corporation, 1201 Cadillac Court, Milpitas, CA 95035, (408) 946-7100.

Mention that you read about it in the *Computer Shopper*. ●

Frameworks II

continued from page 100

or to another machine, there is an "uninstall" utility. However, there are still potential crises! You cannot uninstall from a crashed hard disk. Many commercial users refuse to load any copy protected program on to their hard disk. Ashton-Tate should have more faith in its programs. Others have found that piracy has not hurt the most successful software, but has probably generated more demand and widened their markets.

- The bug in earlier releases that froze the keyboard when attempting a PrtSc has been corrected. But, while the program has many built-in fail safes, it still freezes the keyboard when you attempt to access a macro while in Speller mode.

- In order to change line-spacing within a document, as when indenting a quotation on an otherwise double-spaced page, it is necessary to put the single-spaced material in a separate frame, and to put the text before and after it in separate frames. If the document uses a bunch of such indented quotations, the procedure is lamentably and unnecessarily complicated. This feature undermines to some extent the progress shown by the doubling of frame buffer size to 66K.

Some User Tips

Here are some user tips gleaned from dozens of hours of use of FW and FWII; and a few undocumented features that I discovered quite by accident.

When opening a new document frame, be sure to set the default drive so it will save to the correct disk. Do this by placing the cursor/pointer on the drive letter and then pressing simultaneously Control and Enter. Otherwise the new file will try to write to the software drive, even though the cursor be on the correct data disk.

The Control key, in combination with a number, will cause the next command to be executed the number of times of the number; for example, if you want to move the cursor ahead 20 lines, hit Control-20, then hit the cursor down arrow once. If you wish to go to the beginning of the fourth paragraph back, hit Control-4, then Control-Cursor arrow up. If you wish to go ahead 12 sentences, hit Control-12, then hit Control-Arrow down.

Control in combination with the grey + and - keys on the right of the keyboard will leap in or out of whatever frame level you are at to the highest level; or conversely back to where you were at the lowest level.

Special characters, including diacritical marks for foreign languages, and Greek charac-

continued on page 102

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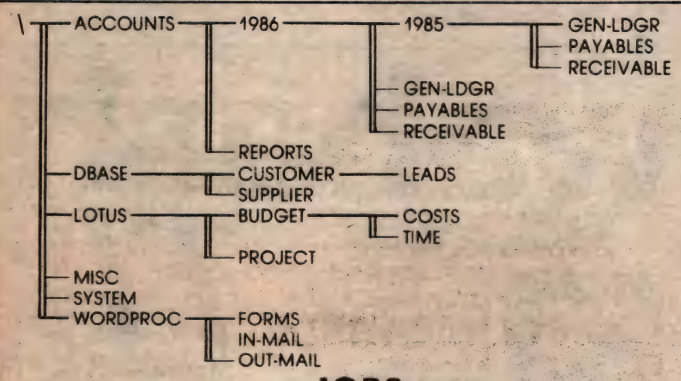
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Frameworks II continued from page 101

ters for math equations, etc. can be entered on the screen by hitting Alt in combination with the correct character number on the numeric pad. The character will appear when Alt is released, and will print if your printer is set for the correct character set and has graphics capabilities. The numbers for the special characters are in the range from 128 to 255. Included are fancy single and double lines for borders and ornamental boxes, with corners and various kinds of intersections provided as well. You can discover what characters are available by experimentation, or by consulting the DOS manual.

To draw vertical or horizontal lines quickly, use the following procedure: Hold down Control while entering a number, the length of the line desired, on the top row of keys. Now release Control. Next, hold down Alt while entering on the numeric pad the appropriate ASCII decimal for the graphic character desired. When you release the Alt key, the line will draw itself!

When copying System Disk 2, the main program disk (which is not copy-protected), leave some space for a printing cache on the disk. FWII uses this system for background printing. By leaving extra space, the computer is freed up for continued editing while a file is printing from background. If there is not enough room, FWII provides a fail-safe routine, printing from memory. But that ties up the computer until the printing be completed.

Warning! Keep the commands MOVE and COPY clearly in mind when transferring a block of text between files or frames. The former deletes it from its original location and, once the file is resaved to disk, destroys the original version. COPY is much safer, leaving the original file intact for separate editing.

Another warning. It is a simple matter to get the same file on the screen more than once, that is, in several frames all having the same names. Not a good idea. If you forget which one has all the revisions in it and try to save a different copy, the one with all the hours of work will be over-written on the disk.

If you pay attention now you can spare yourself endless agony. If you desire to produce text with right justified margins, beware the Justification-Gremlin. This is a quirk that drastically slows down data entry and becomes a stiff pain in the neck; but it can be avoid-

continued on page 104

PC Version of Roadsearch and Roadsearch-Plus

Columbia Software (Columbia, MD) has released the IBM-PC version of Roadsearch and Roadsearch-Plus. These computerized roadmaps simplify the tedious process of determining driving routes for anyone who travels over the interstate highway system.

Roadsearch computes different types of routes. The most powerful program determines the shortest practical route between cities in its database. This program also avoids toll or any other roads specified. Another program develops routes which may be longer, but more suitable to a user's specific needs. The printed outputs include the driving route, distances, travel times, and fuel usage in different formats.

Roadsearch contains a database of 487 cities/road intersections and about 70,000 miles of interstate and major throughhighways throughout the U.S.A. and Canada. In addition to the features contained in Roadsearch, Roadsearch-Plus also offers the powerful Roadmap Development System which lets individual users customize their roadmaps. Users can add up to 269 towns and/or road junctions anywhere in North America. This can include local roads, favorite shortcuts, new destinations, and other information which keeps the database current.

Roadsearch-Plus, as well as Roadsearch, have been human engineered and extensively tested to assure reliability. Error trapping is employed throughout to help avoid most errors. There should be little difficulty mastering either program in a very short time.

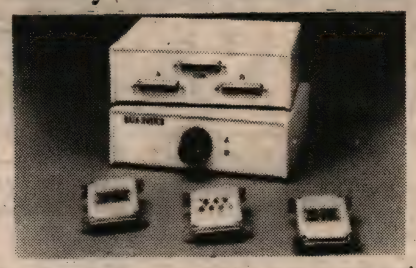
Columbia Software is continuing its policy of delivering unlocked software. This means that back-up copies can be made with most standard copy programs. All Columbia software carries a 15 day money-back guarantee.

Roadsearch and Roadsearch-Plus are currently available for the IBM-PC and compatible computers, the Apple II family, and the Commodore-64/128 with disk. Roadsearch-Plus retails for $74.95. Roadsearch is available for the low price of $34.95.

For more information contact Columbia Software, P.O. Box 2235P, 5461 Marsh Hawk, Columbia, Maryland 21045, (301) 997-3100. Mention that you read about it in the *Computer Shopper*. ●

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Uniform Software continued from page 94

machine and work the data file with ease. When you are finished the disk can be returned to the machine "X" and accessed the same as before.

The documentation for *Uniform* is very well written and attractively presented. More programs should have docs like these. The READ.ME file on the disk serves to update the documentation. Don't forget to read this file. I printed it out and added it to the manual. Reading the manual all the way through will help you understand not only *Uniform* but a lot about disk drive formats and access in general. MicroSolutions offers phone support for registered owners if needed. They were most pleasant when I called and my questions were answered quickly and without making me feel like a fool for missing that file on the disk.

The program does just exactly what Microsolutions claims it will and it is a joy to run. I could find no problems with the package at all. If you have compatibility headaches *Uniform* may be just the ticket to brighten your day and the price is right. With all this it would be hard to go wrong with *Uniform*.

Uniform for IBM PC, XT, AT or compatible
$69.95 + $3.00 S&H
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DeKalb, IL 60115
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UniForm by Micro Solutions
Version 1.08 [01706248] for IBM PC & Compatibles

---------- Format Selection Menu #1 of 4 ----------

Fmt	Type	Description	Fmt	Type	Description
A	DS:DD:48	A.B. Dick Magna III	N	SS:DD:48	Cromemco w/Intl Term CPM
B	SS:DD:48	Actrix	O	DS:DD:48	Cromemco w/Intl Term CPM
C	DS:DD:48	Actrix	P	DS:DD:48	Cykey
D	DS:DD:48	Advanced Digital Super 6	Q	DS:DD:48	Datavue DV80
E	DS:DD:48	Adv. Digital w/TurboDOS	R	SS:DD:48	DEC VT-180
F	SS:DD:48	Bondwell 12	S	DS:DD:48	Digilog
G	DS:DD:48	Bondwell 14	T	DS:DD:48	Direct 1025
H	DS:DD:48	BMC if800 model 20	U	DS:DD:48	Epson QX-10
I	DS:DD:48	CAL-PC	V	DS:DD:48	Epson QX-10 (European)
J	DS:DD:48	Columbia Commander 964	W	DS:DD:48	Fujitsu Micro 16s
K	SS:DD:48	Compugraphic	X	DS:DD:48	Gnat System 10
L	SS:DD:48	Cromemco CDOS	Y	SS:DD:48	Heath w/Magnolia CP/M
M	DS:DD:48	Cromemco CDOS	Z	DS:DD:48	Heath w/Magnolia CP/M

Current format for drive C: (No format selected)

Options: Fmt letter, SPACE BAR, menu #, Ctrl-I, RETURN to quit or ? for help

UniForm by Micro Solutions
Version 1.08 [01706248] for IBM PC & Compatibles

---------- Format Selection Menu #2 of 4 ----------

Fmt	Type	Description	Fmt	Type	Description
A	DS:DD:48	Hewlett Packard HP-125	N	DS:DD:48	Magic Computer
B	SS:DD:48	IBM PC using CP/M-86	O	DS:DD:48	Micron Quark
C	DS:DD:48	IBM PC using CP/M-86	P	DS:DD:48	Molecular Series 9
D	SS:DD:48	IBM PC-DOS Version 1	Q	SS:DD:48	Morrow MD2
E	DS:DD:48	IBM PC-DOS Version 1	R	DS:DD:48	Morrow MD3
F	SS:DD:48	IBM PC-DOS Version 2	S	DS:DD:48	NCR Decision Mate V
G	DS:DD:48	IBM PC-DOS Version 2	T	SS:DD:48	NEC PC-8001
H	SS:DD:48	IMS 5000	U	DS:DD:48	NEC PC-8801
I	DS:DD:48	IMS 5000	V	DS:DD:48	OKI if800 model 20
J	SS:DD:48	Kaypro II	W	DS:DD:48	Olivetti
K	DS:DD:48	Kaypro 4	X	SS:DD:48	Olivetti ETV 300
L	DS:DD:48	Kaypro 10	Y	DS:DD:48	Olympia EX-100
M	SS:DD:48	Lobo MAX-80	Z	SS:DD:48	Osborne 1

Current format for drive C: (No format selected)

Options: Fmt letter, SPACE BAR, menu #, Ctrl-I, RETURN to quit or ? for help

UniForm by Micro Solutions
Version 1.08 [01706248] for IBM PC & Compatibles

---------- Format Selection Menu #3 of 4 ----------

Fmt	Type	Description	Fmt	Type	Description
A	SS:DD:48	Osborne Executive	N	SS:DD:48	TI Professional CP/M-86
B	DS:DD:48	Otrona Attache	O	DS:DD:48	Toshiba T100
C	SS:DD:48	Philips PC-2010	P	SS:DD:48	TRS-80 Mod 3 MM CP/M
D	DS:DD:48	Sanyo MBC-1000	Q	DS:DD:48	TRS-80 Mod 3 Holmes CP/M
E	SS:DD:48	Seequa Chameleon CP/M	R	SS:DD:48	TRS-80 Mod 4 MT CP/M
F	DS:DD:48	Seequa Chameleon CP/M	S	SS:DD:48	TRS-80 Mod 4 CP/M
G	DS:DD:48	Sharp	T	DS:DD:48	Wangwriter
H	SS:DD:48	Superbrain JR	U	SS:DD:48	Xerox 820-II
I	SS:DD:48	Superbrain 40 track	V	DS:DD:48	Xerox 820-II
J	DS:DD:48	Superbrain QD	W	DS:DD:48	Xor 5
K	SS:DD:48	Systel II	X	SS:DD:48	Zenith Z-90 48 TPI
L	DS:DD:48	TeleVideo	Y	SS:DD:48	Zenith Z-100 CP/M
M	DS:DD:48	Tektronix 4170	Z	DS:DD:48	Zenith Z-100 CP/M

Current format for drive C: (No format selected)

Options: Fmt letter, SPACE BAR, menu #, Ctrl-I, RETURN to quit or ? for help

UniForm by Micro Solutions
Version 1.08 [01706248] for IBM PC & Compatibles

---------- Format Selection Menu #4 of 4 ----------

Fmt	Type	Description	Fmt	Type	Description
A	DS:DD:48	Zorba			

Uniform Menu Selections

```
A
Drive C set to: TRS-80 Mod 4 MT CP/M [SS:DD:48]
DOS PROMPT AFTER DRIVE HAS BEEN SET
TO TRS-80 MODEL 4 MT CP/M FORMAT
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Frameworks II continued from page 102

ed. FW's right justification facility will try to maintain the margin for every editing change as you go along. This causes text to move left as well as right, lines to break and change in unpredictable directions as you type. The squirming of the text would not be a problem if the process did not slow down data entry by a factor of about 10, making it very frustrating and time-consuming to edit a file.

The solution: place the cursor on the highest level frame, summon the "Words" menu (by Control-W), change the file format from "Justify" to Align left." Now you can edit under normal conditions. Lines will only push to the right as the Good Lord intended. When you are satisfied with your work, then repeat the process, changing back to "justify." One of the beauties of FW is the rapid way it reformats a text file. When the right justification is back in place, re-save the file to disk. When creating new text in a new file, wait till you are done before setting the right justification.

Conclusions

Both FRAMEWORK II and SYMPHONY 1.1 represent the resurgence of integrated programming at a more advanced state of the technological arts. Integration will never again be lightly regarded, but is surely on the way to dominate the market within the next few years! Of the two, the Ashton-Tate entry is notably more courageous and powerful, and opens the way for yet bolder innovations in the future. Extended memory access, higher speed, and more efficient uses of memory and storage space are equal in both, but FWII takes a quantum leap into the future with its integral dynamic outlining and multiple frame structure. As the micro continues to invade the spheres of the mini and the mainframe, users will demand front end simplicity combined with immense power and capability, which only highly sophisticated integrated software will afford them. No programmer will ignore the lessons implicit in these developments.

Framework II
Ashton-Tate
20101 Hamilton Avenue
Torrance, CA 90502-1319

Symphony I
Lotus Development
245 First Street
Cambridge, MA 02142

New Time Management Packages

Techland Systems Inc. has announced the availability of Shoebox I, II, and III, a family of sophisticated time management software packages, including the only time management software available for use in a network environment.

The Shoebox family is designed for users of the IBM PC, XT, AT and IBM compatibles.

Shoebox III, the most sophisticated of the three products, is designed specifically for network environments. It allows up to 127 groups of 80 users in each group to share a common file server and permits program coordinators in each group to search across multiple workstations for:

*common time blocks to schedule meetings

*common appointment and project activity

*simultaneous access of files where password security permits

Shoebox III also allows a coordinator to send messages to select users. With Shoebox III, for example, a departmental administrator can find an available two-hour time period when most of the department will be available for a meeting, then enter a notice of the meeting in the appropriate time slot on each workstation.

In addition to its network features, Shoebox III offers users the ability to do expense accounting and to prepare printed expense reports, review the history of specific data or conduct a brief review of an upcoming 30-day schedule and maintain an appointment calendar with advance notice queues and printed schedules for planning. For example, all future meetings on a specific project, all past meetings with individuals involved in the project or all milestones on the project can be called to the screen and printed. A built-in expense tracking function allows the user to maintain an accounting of expenses incurred or billable time expended.

Networks supported include Orchid PC-NEt, Fox Research 10, Net, the Nestar PLAN, 3 Com's Ethernet and ViaNet.

Shoebox II is designed for multiple users in a standalone PC environment and can accommodate a number of users limited only by space on a single hard or floppy disk. It features an appointment calendar, reminder/tickler file for future engagements, expense accounting and a recurring items schedule. It also allows the user to prioritize activities and to find a time block to schedule meetings for up to 80 users at once. Shoebox II is maintained in the background and a special hotkey allows the user to toggle back and forth to the main program. Shoebox sets an alarm to ring for appointment schedules and allows the sending of messages to select users. In addition it automatically purges old data to control file sizes.

Shoebox I is designed for the single user in a standalone environment. It offers all the appointment, reminder and expense functions of Shoebox II.

Retail prices include $75 for Shoebox I; $195 for Shoebox II and $350 for Shoebox III. Each node installation for Shoebox III is $10.

For additional information contact Techland Systems Inc., 25 Waterside Plaza, New York, NY 10010; (212) 684-7788.

Mention that you read about it in *Computer Shopper*. ●

"Grasp" Software Technology

ShareData, Inc., recently announced that it has secured worldwide rights to market a new software technology, code named "grasp," which was featured on the cover of *Scientific American* (September 1984). ShareData said that it has licensed exclusive rights to this technology for the Commodore 64/128 family of computers. An Apple II version is currently under development.

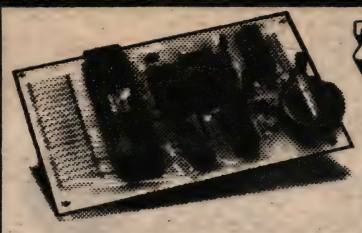
The "grasp" technology, developed by VPL Research, Inc., of Palo Alto, California, consists of a visual programming language that is operated by a patented glove input device. The glove looks and feels like an ordinary lightweight glove. While wearing the glove, the user can "handle" and manipulate images on the computer screen as if they were real objects.

This direct communication between a real hand and the on-screen image introduces a revolutionary new method of computer interaction, said David A. Horowitz, executive vice president of ShareData. Unlike conventional programming the "grasp" will enable non-programmers to modify glove-based programs or create original programs.

Horowitz said the company will use the "grasp" technology to produce animated, reasonably-priced software for marketing through mass retailers nationwide. He added that these new titles will be designed to operate more quickly, easily and efficiently than Commodore programs currently on the market.

For additional information contact ShareData, Inc., 7122 Shady Oak Road, Eden Prairie, MN 55344; (612) 829-0409.

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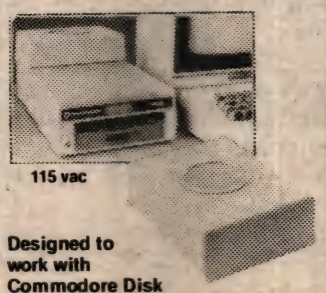
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Grafix Connection Program For New Three Dimensional Graphics Software

Three D Graphics, a joint venture of The Grafix Connection and DDD Software, Inc., has announced an imaginative dealer program with its new graphics software, Perspective. Perspective is a three-dimensional business and scientific graphics system for personal computers. According to Grafix president Elmer R. Easton, the new program provides graphics and text capabilities previously available only on mainframe computers. The introductory list price is $295.00.

"Our dealer program starts with a set of tools that help the software to sell itself," said Easton. "The more salesman time needed to sell a product, the lower the real profit for the dealer. We are supplying self-running demo programs with eye-catching three dimensional effects that will enliven many of the static hardware displays you see in the normal computer store."

"When a customer steps up to a computer running one of our demos the program will invite him to interact. The demo does most of the selling, with little help from the salesman. In addition to the self-selling demo, we are supplying posters and other related materials to support the product and the dealer."

Easton also said that Three D Graphics will supply telephone numbers for customer and dealer support. Customers will be able to call for the location of the nearest dealer; dealers will be able to call for technical support and delivery information.

Efforts To Minimize Inventory Needs

Dealers sometimes find themselves forced to buy large inventories of products just because they cannot be readily re-ordered and delivered by the supplier. According to Easton, Three D Graphics will enable dealers to keep their inventories at lower levels by providing them with fast response to their orders. "We can minimize their inventory requirements because they will have no trouble receiving additional merchandise from us," he said.

Easton promises a further incentive by offering quick payment terms to dealers who can gain an extra profit margin by timely payment of invoices.

Easton predicts that dealer profit margins will be "generous" and does not expect a problem from competitive discounting. "We do not anticipate discounting because our product is unique," he said. "There is truly nothing like it in the world of PCs. Because there is virtually no competition, dealers won't have to sell the price of one program over the price of another program that does the same thing. No one else does PC graphics as well as we do. Just about everyone who sees the program tells us that."

Perspective can generate three-dimensional visuals from the complex numerical data. True perspective is maintained as the user manipulates the visual so that the illusion of a solid object persists however it is viewed. Easton foresees valuable applications for Perspective in a broad range of fields of interest to businessmen and consumers, including finance, science, medicine and education. Currently, Perspective in Color will be available early in 1986.

Perspective may be unique in that it uses high resolution graphics (720x350 pixels) inherent to IBM PC, PC XT, PC AT, and non-IBM PC equivalents when configured with a Hercules or similar graphics controller. Perspective may also be the first graphics program designed to run on the many non-IBM PCs that have built-in high resolution (640x400 pixels) graphics capability.

Three D Graphics offers exclusive porting to "virtually any" brand of computer that has adequate resolution and enough internal memory (512K). The company believes that this customizing service will greatly assist dealers because no other program makes an offer of this kind.

"One key advantage to the dealer," said Easton, "is that Perspective opens up the vast after market for the millions of existing PCs, as well as future products. Whereas a new spreadsheet or word processing program must be sold based on its advantages as compared with a program the customer may already own, Perspective gives him a capability he never had before. The market potential is enormous."

Perspective and Perspective in Color are the first in a planned line of graphics and associated software scheduled for introduction by Three D Graphics, beginning in 1986.

For more information, contact The Grafix Connection, 860 Via de la Paz, Pacific Palisades, CA 90272, (213) 459-7949.

Mention that you read about it in the *Computer Shopper*. ●

Ashton-Tate Assists FBI In Investigation

Ashton-Tate, a leading developer and marketer of microcomputers business software, announced it recently worked with the FBI in an investigation of alleged software piracy.

As a result of the investigation, federal agents seized computer software and computer equipment believed to have been used by two alleged "computer software pirates" who were reportedly making and selling illegal copies of Ashton-Tate's dBASE II and Framework.

"We have always taken a hard line against software piracy, especially when it is done for profit," said Edward M. Esber Jr., Ashton-Tate President. "Our working together with the FBI indicates the action Ashton-Tate will take to eliminate piracy."

Attorneys for Ashton-Tate brought the problem to the attention of the FBI this summer after being contacted by a consumer who had purchased software from one of the alleged software pirates. The consumer had responded to an advertisement in the Los Angeles Times that offered many software packages, including Ashton-Tate's Framework and dBASE III, at prices substantially below retail. Upon receiving floppy disks with typewritten labels and photocopied documentation, the consumer contacted Ashton-Tate.

The evidence seized by the FBI will be presented to a federal grand jury, which is expected to hand down indictments against the individuals involved for criminal copyright and trademark infringement.

"By cooperating with the FBI on this case, we have established a good working relationship with the agency," said Stanley P. Witkow, Ashton-Tate's general counsel. "We will continue to work with the FBI and other authorities to put a halt to piracy-for-profit operations."

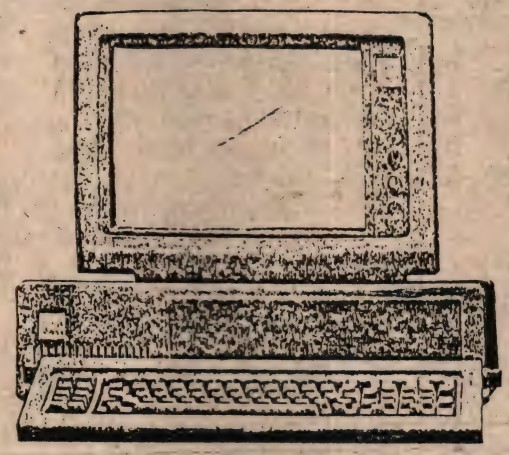
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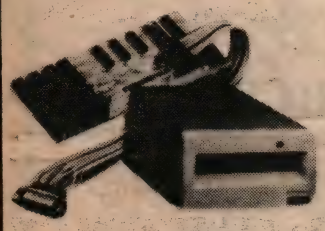
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Grolier Electronic Publishing is distributing a combination package which includes the CD-ROM version of Grolier's highly acclaimed *Academic American Encyclopedia* and a Philip's CD-ROM disc drive. This combination package is now selling at a suggested retail price of $1495. The Grolier package is designed to be used with the IBM PC or compatibles with 256K. This is the first compact disc read only memory product to be sold in retail computer stores.

Frank Farrell, president of Grolier Electronic Publishing said, "Dealer demand for our *Electronic Encyclopedia* has been very strong, but a sufficient number of CD-ROM disc drives has not been available to meet this nationwide demand. We were compelled to provide a complete single price package of hardware and software to get our product moving. We're in several major stores now, and once the disc drives become more widely available, we will expand to full national distribution."

Grolier is distributing the hardware and software package through the following key stores: University of California Computer Store, Berkeley, CA; MicroAge Computer Store, San Jose, CA; Online Computer Store, Modesto, CA; Computer Country, Houston, TX; Computer Solutions, San Antonio, TX; Applied Micro Technology, Tulsa, OK; Computer People, Irving, TX; Computer People, Richardson, TX; Computer Associates, Norman, OK; Compco, Shreveport, LA; IDS, New York, NY; Corporate Micro Services, Inc., San Francisco, CA; and MicroAge Computer Store, Fresno, CA.

The 4.72 inch diameter compact disc has the capacity to store roughly 100 million words or 220,000 pages of text - about 1,500 times more data than can fit on a typical 5.25 inch floppy disc. The CD-ROM is the same size as the digital audio system compact disc.

In addition to browsing the encyclopedia or searching by article title, users can search the entire electronic text for words, groups of words, or concepts in context in seconds by using the electronic index, which is almost as large as the encyclopedia itself.

The *Electronic Encyclopedia* is aimed at students from the higher elementary grades through college and at the curious adult.

The CD-ROM was developed for Grolier by Activenture Corporation, and it uses their search and retrieval software (Knowledge Retrieval System) to access information in *The Electronic Encyclopedia*.

Grolier Incorporated is the world's largest publisher and distributor of quality encyclopedias and reference sets. Grolier's other quality encyclopedias include *The Encyclopedia Americana*, the nation's oldest encyclopedia, and *The New Book of Knowledge*, the critically acclaimed children's encyclopedia. The company is also a leading publisher of children's books and educational materials.

Grolier has operations in twenty-two countries and its products are sold through distributors in more than forty additional countries.

For additional information contact Grolier Electronic Publishing, 95 Madison Avenue, New York, NY 10016; (212) 696-9750.

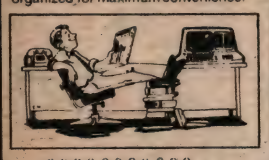
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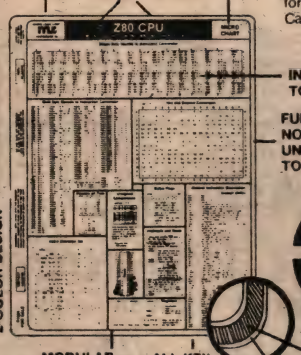
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Amiga?
Continued from page 61

256K RAM for his programs); a "Workbench" disk containing the "Intuition" interface with which the user manipulates most functions; a disk containing ABasiC(tm) — a BASIC program written for Amiga by Metacomco, a British company; and a disk from Electronic Arts containing several demonstrations of EA software for the Amiga. The ABasiC disk also contained a tutorial for the Amiga and some BASIC demos. As it turns out, these are the barest of necessities for the machine. You will certainly want to add software immediately, and that is why we chose to buy Textcraft(tm), an Amiga-specific word processing package by Commodore. Also included with the Amiga is a large three-ring binder to hold the documentation, all of which is provided in 6"x8" format. Two "books" come packaged with the unit: the Amiga User's Guide — a glossy, full color document that is of excellent quality and significantly better than anything I have ever seen from Commodore; and a guide for the user of ABasiC (which is very different from Microsoft BASIC). To my surprise, these both contained errata sheets. I had heard of the many errors and changes taking place, and the rumors are all true. Furthermore, the sheets cannot be inserted as provided, since many changes are listed on the same page. Pen and ink changes must be made to the document itself. Still, in fairness to Commodore, the system is quite new and under development.

As if to demonstrate Commodore's commitment to this machine, we were provided with an "upgrade" package for Amiga at time of purchase, at no additional cost. The upgrade kit consists of two disks containing version 1.1 of "Kickstart" and "Workbench;" more errata sheets for both documents described earlier; and a disk and booklet for Microsoft BASIC, along with

continued on page 112

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Quantumlink And Viewtron

by Al Koller

If press releases, advertisements, and new book publications are any measure of success, the Commodore C-128 personal computer is going to do all right, thank you! After suffering what might be called a "typical" Commodore slow start (the machine was at least five months later arriving than expected), the C-128 seems to be gaining acceptance rapidly. Special Interest Groups (SIGs) are now available on Quantumlink (the new Commodore on-line service), Delphi, and CompuServe; and there are at least eight books already in print specifically for the C-128 computer. Add to that the very extensive documentation provided with the machine and the huge (3 volumes, over 600 pages) Digital Research CP/M Plus (tm) documentation, including two disks of utilities and source code, and you have one of the key requirements for success today--adequate user documentation. Plentiful software is the next ingredient needed, and that too appears to be coming, although it is slower than it should have been. Finally, for any computer to succeed today, you and I--the customers--must also appear in large numbers and spend our dollars supporting the "habit" that has become the fastest growing hobby in America, home computing.

Judging from the third quarters' loss at Commodore, you and I haven't been doing our part, but maybe that is about to change as the Christmas season and the release of new items begin to be felt. This review covers three of the latest of these "goodies" which I think point the way to the future for our hobby, and I hope Santa brought you at least one of them to make your holiday more fun.

Viewtron (tm) From Viewdata Corporation

The Viewdata Corporation of America, based in Miami, Florida, has entered the field of telecommunications in a big way for Commodore users. Extending their earlier work in Vidtex, Viewtron provides a custom disk for Commodore uses that permits access to the system automatically and allows screen controls so that color and graphics are made available on-line. Following the procedure included in the User Guide, you will "build" your own disk for automatic dial-up and sign-on, then put it into service for completing billing information and receiving your free first hour of non-prime time use. Viewtron is similar in some ways to other on-line services such as CompuServe and Source. It differs, however, in at least two very important ways. First, it is customized to your machine so it can provide very good quality graphics and color. The screens I've seen from other services never looked this good! Second, in addition to the more traditional activities such as financial advice, news, travel, entertainment, home banking, SIGS, and CB exchanges, Viewtron offers an auction called BidQuik which works in *reverse*. Instead of the price being bid up, the price starts at some point and drops every fifteen minutes until the item is sold!!! The first one to accept the current price gets the merchandise, and there is a wide variety of products sold. You can even enter a "floor" bid, making you the buyer if the price falls to that point, and you do not have to be on-line at the time to win the bid. Pretty interesting idea...

Although there are extra costs for using Viewtron during "prime" hours--7 a.m. to 6 p.m. weekdays--there is no extra charge for 1200 baud and no minimum per month. You are charged only for the time you are on, at $5.40 per hour non-prime or $13.20 per hour prime time, plus communications charges (usually $2.00 per hour). There are some drawbacks, of course (aren't there always?), and only time will tell how serious they will be. For example, you can save screens and download data.

continued on page 117

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Inside Commodore continued from page 62

Computer Shopper. (Refer to Figs. 1 and 2 for more information.)

Additional Hardware:

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Prototype PC board
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DB-25 Connector and cable

The electrolytic capacitors could also be tantalums. Their value is not critical, but if substituting, use always use a higher value and voltage rating, not lower (although you could get away with it in a pinch). Likewise with the rectifier diodes. The converted ICs can be any of the compatible chips like MC1488/89, SN75188/89, DS1488/89, etc. The 7404 can also be 74LS04 or any other TTL family part with the same function.

Part	Description	Radio Shack Part No.
U1	7404 Hex Inv.	276-1082
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U3	1489 Line Receiver	276-2521
C1 - C4	100 ufd. 35V Electrolytic Capacitor	272-1028
D1 - D3	1N4001 Diode	276-1101
SW 1 - 2	8 Position DIP Sw.	275-1301

For the RS-232 connector, I used a ribbon cable with a 26 pin IDS (Insulation Displacement Socket) on one end and a ID-type DB-25 connector on the other. I mounted a 26 pin header on the PC board, and it mates with the cable. You could also use a PC-mounted DB-25 connector on the interface board and a normal RS-232 cable with DB-25 connectors on both ends.

Setting the Configuration Switches

Assuming you have wired the DIP switches according to the diagram, you can configure it either as a DTE or DCE device. Explaining all that's involved in DTE and DCE is well beyond this article. I'll just assume you are familiar with the RS-232 standard.

Anyway if you have the two DIP switches mounted side by side, and they are numbered 1 to 8, from left to right, here is how they would be set:

For DTE configuration:

Dip Switch #1:

	1	2	3	4	5	6	7	8
On	x		x		x		x	
Off		x		x		x		x

Dip Switch #2:

	1	2	3	4	5	6	7	8
On	x		x		x			
Off		x		x		x	x	x

For DCE configuration:

Dip Switch #1:

	1	2	3	4	5	6	7	8
On		x		x		x		x
Off	x		x		x		x	

Dip Switch #2:

	1	2	3	4	5	6	7	8
On		x		x		x		
Off	x		x		x		x	x

(Note: Either a RI or a DCD line can be an input in DTE, but not both. Also, either DCD or RI can be driven high in a DCE configuration. The above DCE configuration has DCD as a high output.)

Construction Alternatives

The interface that I'm presenting here is a deluxe model. You may not want or need all the features that it has. If you are only going to be using a 3-line interface between your computer and external modem, you can build a much simpler circuit than what I'm describing.

A 3-line interface can be accomplished with just two IC chips, some discrete parts, and the appropriate connectors. Two good "Commodore to RS-232" circuits have been published in *BYTE* magazine (March '85, page 183 and May '83, page 331) that take this approach. I also understand that *AHOY!* magazine recently published a simple 3-line interface circuit.

On the other hand, in order to use an RS-232 printer (or other device that requires hardware handshaking), you will need more circuitry to implement at least a 4-line interface. In order to access the more advanced features of many modems, you need even more lines (like carrier and ring detection). If you want your interface to work with different types of RS-232 devices, you also need a way to easily re-configure it. The interface circuit described here has all those features.

Some Late Commodore News and Rumors From CES

No New Commodores...Yet

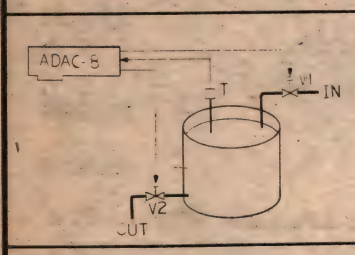
From some reports, the January CES (Consumer Electronics Show) in Las Vegas was a little lackluster when compared to previous shows. Recent comments from Commodore company execs have lead to speculation that Commodore was possibly going to introduce some new computers in early 1986, maybe even at CES. Commodore did have a limited presence at CES, but no machines were introduced. There may still be some new versions of the Amiga in the works, though. A less expensive model is expected that will be more price competitive with Atari's 520 ST.

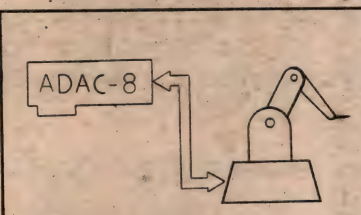
Commodore Cancels Some C-64 And C-128 Products

Some of Commodore's announcements that preceeded CES were not really great news for C-64 and C-128 users. Several products that had previously been announced are now canceled, including rhe 1572 dual disk drive, the LCD laptop computer, and the "never officially announced" C-128 hard disk. Commodore has given no official reason as to why these products are canceled, but rumor is that the company is still reeling from 1985's record losses and the strategy is to exploit current markets in favor of developing new products. That means they're using their money to pay bills, instead of tooling up new production lines.

The 256K and 512K RAM expansion packs are still a "go" at this point, but haven't made it into distribution. A rumor from those "in the know" is that the RAM cartridges will be compatible with the C-64, but the fact won't be advertised by Commodore. ●

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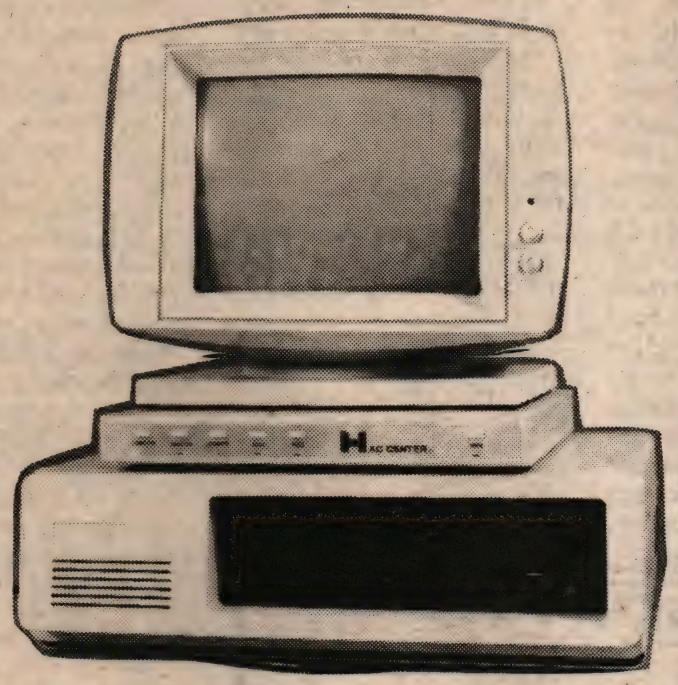
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Amiga?
continued from page 108

the errata sheets for that document. We were very fortunate to obtain the upgrade, since it had just been released and corrected many bugs. It also provided us a more familiar BASIC environment to use on the machine. Unfortunately, there is no in depth user data for machine manipulation outside the "Intuition" environment, and that is a significant shortcoming which Commodore must remedy soon. For example, there is no way to establish a RAM disk using the documentation provided, although this function appears to be supported fairly easily using the AMIGADOS operating system. The dealer had a prerelease copy of this book, but users will find it a necessity.

Back to the hardware. Right out of the box, the system plugs together in about two minutes. The main unit is a very attractive, low profile box which sits only about 3½" above the desk top and provides a perfect place for the monitor. The keyboard slides underneath when not in use. On the front of the main unit is a cap which covers the RAM expansion port. We snapped the cover off and installed the additional 256K RAM we had bought (Model A1050) in about two more minutes. It plugs right in and has two small Phillips head screws to seat it permanently. With the A1050 installed, the system contains 768K of RAM, of which 512K are available to the user. However, the Workbench requires some of that memory (about 90K), so you will be left with about 410-420K after you boot up the system. The dealer insisted that the RAM was needed, and after using Amiga, I agree with him.

At this point the system is ready to use, except for the external monitor. Amiga does not come with a built-in monitor, so the user must supply one. On the C-128 I had used a Zenith ZVM-131 monitor which provides for both composite and RGB input. It worked well on the C-128, so we did not buy the Amiga monitor ($495). I had some difficulty with the RGB display for Amiga (improper voltages for the monitor, I think), so we used the system in composite mode most of the time. The display is beautiful, with brilliant colors and nicely defined text. The Amiga is advertised to be IBM plug compatible, but we ran into our first problem when we tried to attach our monitor. In order to fool-proof the cabling, Commodore has equipped Amiga with two 25DB and two 23DB connectors — one male and one female for each. That makes it impossible to unintentionally connect the wrong units to the system. Based on past experience, I think that's a great idea, but have you ever tried to buy a 23DB connector? Try it. I guarantee that even the best electronic supply house will not have one for you. So what does one do? Well, we looked around and asked our dealer, and he allowed as how they had found they could cut down a 25DB to the 23DB configuration with little trouble, and it worked just fine. Being adventuresome, that is exactly what I did, grinding off the two outer pins in a few seconds and checking the configuration carefully. Although the Amiga User Guide provides pin-out lists for all ports, there are no pictures to guide the novice, so there is a little guess work about which end the numbering begins with, etc. However, it is pretty straightforward and we were able to assemble a connection cable in about one hour. (There is a cable available for $40 with the DB23 on one end and a pig-tail for your own connector on the other, but I found out about that too late to take advantage of it. Besides, my conscience winced at the $40 price tag.)

Using The Amiga

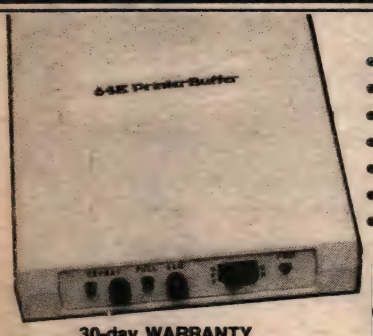
Once the monitor is hooked up, the unit can be powered and you are greeted with a large icon showing a hand holding a 3½" "Kickstart" disk, properly oriented to insert it into the Amiga built-in drive on the right hand corner of the unit. Insert the "Kickstart" disk and the unit automatically boots the operating system. Another icon then appears, holding the "Workbench" disk. Insert this disk and the system boots the Intuition system which allows you to do many utility type activities directly on screen using the mouse. The Workbench allows you to select either 60 or 80 column text display, colors for the screen areas and cursor, cursor type, mouse "click" speed, printer type, serial port use, clock type and time/date, etc. in an area called "Preferences." It also allows you to select Workbench tools (e.g., disk copier), the trashcan icon to discard work, and other items stored in "drawers" on the workbench. Each of these items is displayed graphically in the workbench "window."

Windowing is used extensively on Amiga, and it takes some getting used to for those who are accustomed to full-screen computers and keyboard entry. Although the mouse can be set aside and the keyboard used exclusively, the Amiga is built around the mouse with heavy dependence on visuals. Refusing to use the mouse will detract, in my opinion. Also, the windowing environment of Amiga is very powerful. It resembles the Apple Macintosh very closely, and I am surprised we have not seen a lawsuit from Apple ala the DRI example. Windows can be opened independently of one another and true multitasking — where operations take place in separate windows simultaneously — is well supported and easily demonstrated. My son had about 20 windows open, all running different BASIC demonstrations at the same time. Furthermore, the Amiga allows windows to be sized from full-screen to about one square inch; to be placed behind or in front of any other window (without affecting what is occurring in either window); moved up or down on screen, or even off screen if desired; or removed with a single mouse command. That is real power!

The buttons on the mouse are used independently. The right hand button calls up the "pull-down" menus which characterize the Intuition interface. A touch of the right hand button brings the current window options into the top border of the window. "Dragging" the mouse (holding down the button while moving the mouse) brings each options menu into view. Even second and third tier menus are used,

continued on page 113

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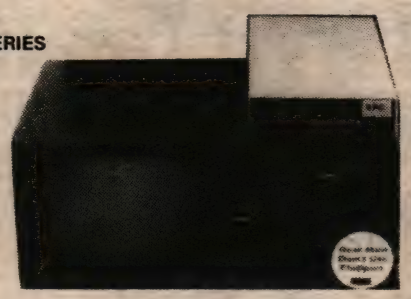
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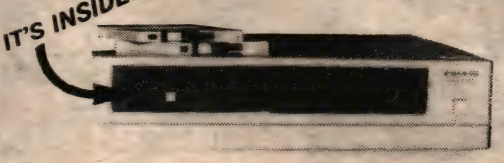
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Amiga?
continued from page 112

so multiple choice options are supported easily. All this is done for the user without any need for prior knowledge of the system, except that you must remember which button to use on the mouse. Documentation will be less important and time goes by in this environment. The left button "selects" the operation you wish to execute, and Amiga then takes over to load in your choice or activate a module if it is already in memory. It is quite efficient, taking what seemed very little time to do what was needed. While you are waiting for the machine to load, an icon showing a small cloud-like picture with the letters z-z-z (as in cartoons for sleeping) remind you that Amiga is busy, and you must wait. The mouse is disabled during this time, so you cannot work ahead, but very little time goes by before the icon disappears and the "arrow" icon reappears. You use the arrow to move to your next action and either review menu (right mouse button) or select again (left mouse button). It probably sounds complicated, but it is really quite simple and very intuitive (pardon the pun). It is not comfortable at first for me, because I am so accustomed to using the keyboard. But I think it would be an easy transition to make.

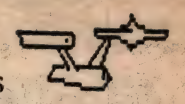
Some Problems With Amiga

The major shortcomings of Amiga became more obvious to me as I began to work with it to do things such as word processing. As a matter of fact, I never really got any production out of the machine. I used the cable purchased with Amiga to connect my Gemini 10X printer (standard Centronics interface, dot matrix printer) and my Olympia EC-2 daisy wheel electric typewriter/printer (also standard Centronics). Then I booted the Textcraft word processing program and began to work. One important fact that should be noted is that Amiga without a second disk drive is pretty demanding. It will require that you swap disks, sometimes several times. Although the screen icon automatically tells you what is needed, it is annoying to have to take disks in and out to boot up each program. With less RAM I expect the problem would be even worse, but for the cost of the Amiga, I felt this shortcoming was important. If you have used a Macintosh, the Amiga routine will be familiar to you. Amiga is much faster, but your intervention is required nonetheless.

The only "production" software now available for Amiga is Textcraft(tm) and Graphicraft(tm) from Commodore, and Deluxepaint(tm) from Electronic Arts. Graphicraft and Deluxepaint do similar jobs, although the Commodore version is much less powerful — almost crude by comparison. Although I did not buy Deluxepaint (because they had sold out already!), I did have it thoroughly demonstrated. It is an amazing graphics art program, sort of a combination of "draw" and "paint" on every other machine you have ever seen, all combined into one. It supports circles, squares, and other geometric shapes; does full color work, including fill, color change, and thematic mapping; permits text input; allows unlimited sizing and mirroring (up to 40 mirrors at a time!), and supports multiple windowing and library function to store and re-use your own art, as well as "clip" art already provided in the program. If you have ever seen Print Shop(tm), imagine it, combined with the best graphics paint and draw, all in color, and you have some small idea of what Deluxepaint will do. Graphicraft will never sell in

continued on page 114

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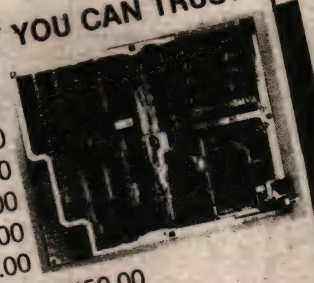
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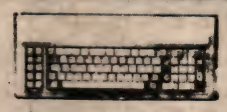


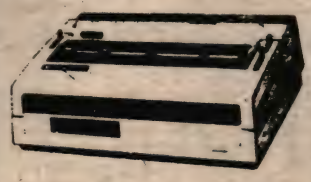
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Amiga?
continued from page 113

the same league...without a doubt, Deluxepaint demonstrated the power of Amiga and gave some idea of what will be coming in the future, but for myself, I am not an artist, so it would not be of significant value as a primary production tool. My personal interest was in word processing, so I bought and tried Textcraft.

Textcraft is what I will call a medium-power word processor built around the Amiga icon/mouse environment. It uses pull-down menus and multiple options to support full screen editing, font choices, type styles, page formatting, cut and paste operations, indentation (limited), pagination, headers, footers — all of the essentials. It goes a step further by providing a "library" of standard formats which can be used directly, prompting the used to fill in the blanks in completing a job. Business letters; resume's emphasizing education, job experience, or functional capability (all from the same data!); and term papers (including prompted entry for bibliography!!!) are examples. As I used this program, I wondered why someone hasn't done this before. There is nothing on Amiga which makes this particularly unique to the machine, although the pull-down menus and simple operation made it possible to use it with no manual or preparation at all. The uniqueness was in the prepared formats and the "library" concept which could be put into every existing word processor, regardless of the machine it is run on. Like spelling checkers, I predict this capability will become a mandatory add-on for every new package and all future upgrades. I liked it!

But now comes the point at which I made the next crossroads decision. When I tried to move my text to the printer, I had all kinds of trouble. In spite of everything I attempted, I was never able to get the printer to properly support underline, boldface, italics, superscript or subscript. I could get just plain text, but could not support any graphics or special characters on either printer. Textcraft and Workbench both support the "Preferences" utility (tool) which includes a section for setting printer type. What I found was that, although about a dozen popular printers are currently supported, neither of mine is. The printer drivers are embedded in machine code using "C" language and a compiler, so to get a "custom" driver in place of the generic one included with Amiga, one would need to either do his own and get it into "C", then compile it, or have that done by a third party. While I am certain that Commodore will provide this support, probably in later updates to the Workbench program, such operations cannot be done by the user at this time.

What that means is, I was never able to get the output I needed from either printer. A variety of Epson, Diablo, Brother, and Okidata printers are supported, but you will want to check for your specific printer if you want output to your existing machine.

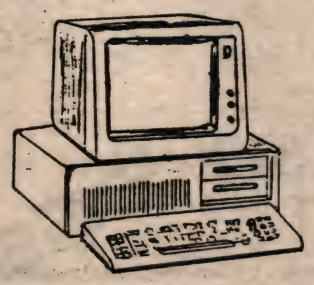
Strengths And Weaknesses Reviewed

At this point I began to evaluate the potential versus the reality of Amiga. Consider for a moment that I had just spent almost $1800 for the latest computer technology. I had to make my own monitor cable, including a somewhat crude modification to the connector. My monitor would not perform correctly in RGB mode because the voltage levels were probably not correct, so an additional "black box" would be needed to adjust voltages. My printers connected to Amiga but could not be used in any of the enhanced print modes because there were no printer drivers to support my existing hardware, and I could not write my own into the machine — even though I had the right escape codes available — because it required a knowledge of "C" and a compiler (essential, a developer's system is needed to do this). I had one commercial word processing program available which provided some of the most often used functions, but not all. For example, Textcraft does not support spelling checkers, nor does it allow mailmerge. The only other software available supports art/graphics, and will really only be effective for use with a VCR or a color printer! There is one modem program which supports telecommunications, but it is only available by mail order. There are no good estimates of when more software will be available. These are very major shortcomings for any new user and must be the subject of serious consideration for any current user wishing to upgrade without loss of capability. In spite of its power and charm, my Amiga would do none of even the simplest of production jobs I did regularly on my Commodore 64!

One other aspect of Amiga should be mentioned before I tell you what finally took place. The Amiga is advertised to run an emulator program called "Transformer" which will run IBM compatible programs (MS-DOS). The "released" version of the Transformer is still not available, although it has been promised weekly since before Thanksgiving. The demonstration version, which I was able to try out fairly thoroughly, does run some MS-DOS programs — but not all. How printers and modems will be supported remains to be seen, but for the user who is moving to Amiga from another machine, this will be a prime requirement. At this point, MS-DOS compatibility is only a promise — one which is likely to be fulfilled, but which remains only a promise today. Given all the power and ability to display color and graphics, play stereophonic music in your choice of several super high quality instrument voices (if you haven't heard it, you should), speak using a resident voice synthesizer, and even emulate another computer (if IBM, why not C-64?), the Amiga is still a developer's

continued on page 116

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74C08	.25	4002	.20	4030	.35	4081	.20
74C10	.25	4006	.65	4034	1.40	4082	.20
74C14	.55	4007	.20	4035	.65	4093	.45
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74LS03	.17	74LS113	.33	74LS244	.65
74LS04	.17	74LS114	.33	74LS245	.75
74LS05	.17	74LS123	.45	74LS246	1.40
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Book Shorts

by Cheryl Peterson

Avid reader that I am, I go through about a dozen books each month. No, they aren't all computer books. Few of them really need a full length article to recommend them, so here are several short reviews that will give you an idea whether or not the book would interest you.

The Commodore 64 Family Helper Super Software For Home Management

This is a nice book for beginning Commodore 64 users that includes a disk with software already on it. The first thing the book does is teach you how to format a disk and then copy the programs to the new disk for use. Along with these instructions come the reasons for working from copies instead of master disks.

From there the book goes straight into instructions on how to use the five programs that are on the disk; Memo Calendar, Checkbook Manager, MiniScribe, Data Manager, and Backgammon. All can be accessed through a main menu or loaded directly by name. The book included instructions for modifying the calendar program to include your own holidays.

The programs are simple to use, sufficiently documented and a good bargain considering the price of the book and disk. The word processor contains

continued on page 123

Amiga?
continued from page 114

machine and a hobbyist's toy. It will have to be thoroughly debugged, properly supported with both hardware and software, and made to interface with most existing peripherals before it becomes the computer reality most of us will support in the marketplace.

Back To The Basics

As you may have guessed by now, I kept the Amiga only three days and returned it to the dealer. He was gracious enough to accept it back, and since I had kept all the packaging and returned it in new condition, I paid a nominal restock fee and was allowed to make the return. I felt very fortunate to have dealt with a reputable organization in the local area, because I surely had made one of the biggest mistakes in my computing career. It is not so much that Amiga was not what I expected. On the contrary, I think it is a super machine. For me, the timing is just not right for changing to a new system which cannot accept my existing peripherals, and I need to be able to do word processing and spreadsheet work easily. I think it is too early for Amiga to be a production-oriented computer for most users. As a hobby machine for hackers and high-tech, early users who can accept a more casual user mode, Amiga will be more fun than anything on the market. A year from now, I will probably be back in the store to purchase an Amiga well supported by all kinds of software and interfaced to all the more common peripherals, but for now that is not the case.

Next Monday when I am back in class teaching business topics to college students, I need to be able to access my text files and grading programs, to print out attendance records and alphabetize lists. When these fairly common applications are available in addition to all the pizzaz, I will buy again. In the meantime, I went back and bought another C-128, on which I am writing this review. I asked around and found that only two machines (out of several hundred sold) have had any problem at all so far — one was mine. I think my first impression was right after all. This is the machine for me...today. ●

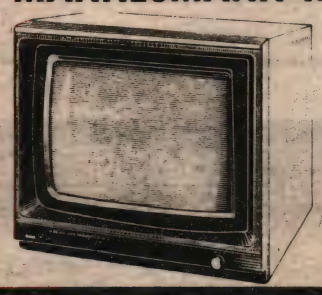


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Quantumlink continued from page 109

However, this appears to be very time consuming and requires you to follow instructions exactly or you will be waiting a long time. The screen refresh takes a while (15-20 seconds), and screen prints "take forever" according to one of our local users! Even so, it's a neat alternative and a welcome choice in telecommunicating. Two pieces of advice come by way of Glenn Wade, the president of the Titusville Commodore Club, Inc.: (1) There seems to be problems with TYMNET and with the FASTLOAD cartridge by EPYX. If you have a FASTLOAD, "pull it out." (2) While saving a screen or series of screens (which will be done automatically), you will want to use the special commands of the functions keys--but DON'T!!! According to Glenn, using them could mess up what was probably a good save. Using the "f" key with the corresponding number is said to work.

I find Viewtron a useful and exciting service which will add much needed competition for Commodore telecommunications users. If you have a user group, you may find that you can receive full support from Viewdata, including free disks and sign-up for your members, if you don't wait too long. They are *very* nice people to talk to and most willing to help if you are having system problems or need asistance. Call them toll free at 1-800-843-9876 outside of Florida; 1-800-272-5400 in Florida.

Quantumlink (tm)--The Commodore Connection

Another new service of special interest to Commodore users is "Q-link," a Virginia based operation specifically and exclusively for Commodore users by Commodore! With color screens, graphics, and a custom disk required for system use, Q-link is similar to Viewtron in some respects but very different in others. For example, Q-link does automatic dial-up and sign-on as does Viewtron, but the rate structure is totally different. Q-link charges a flat rate of $9.95 per month, allowing open access to certain parts of the board during operating hours. Q-link is available 24 hours per day on weekends, but runs only 6 p.m. to 7 a.m. weekdays. Subscribers pay extra for "plus" services--most of which will be the ones an average Commodore user will want to use. You receive one hour of no-charge access per month for $9.95 (which is, in effect, a minimum monthly charge), and are billed for "plus" services used beyond that first hour at a cost of $0.06 per minute for the time used. This is in addition to the Communication service cost, as was also the case for Viewtron. Q-link cannot be accessed via TYMNET. You will have to use Telenet or Uninet to logon. In our area, that means a long distance call, so you may want to check your access before you sign up.

For example, when you "arrive" at the Q-link initial screen, you will be in the Lobby area of The People Connection, all of which is a "plus" service. You cannot save data in this area, which is a big disadvantage for some uses, but you can "talk" to others in the Lobby or move to other areas of the system. Q-link comes with overlay cards which remind you that the system is function key driven. The commands are:

F1 Select (Used to select a choice from the screen)
F3 Talk/Move (to enter a discussion of move to another screen)
F5 Cancel (To cancel a selection or stop an action)
F7 Menu/Help (To get a menu, receive help, move back a screen)

In addition to *People Connection*, Q-link has seven other service areas:

1. *Commodore Software Showcase*, including previews of commercial software and some very nice public domain libraries for download. Both of these are "plus" services.
2. *Just For Fun*, for contests,

continued on page 120

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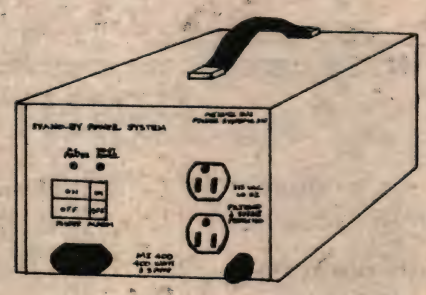
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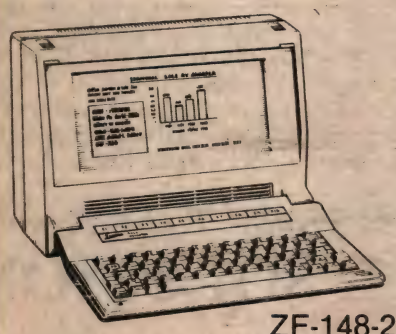
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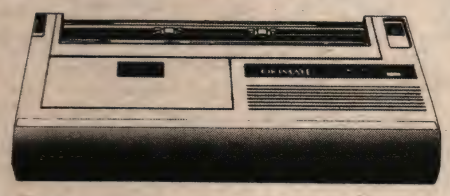
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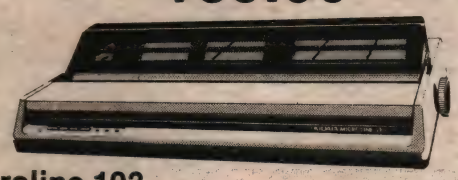
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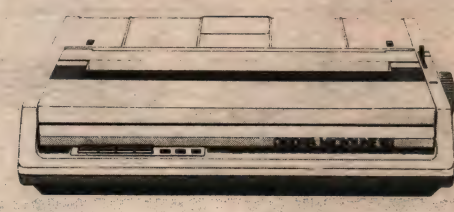


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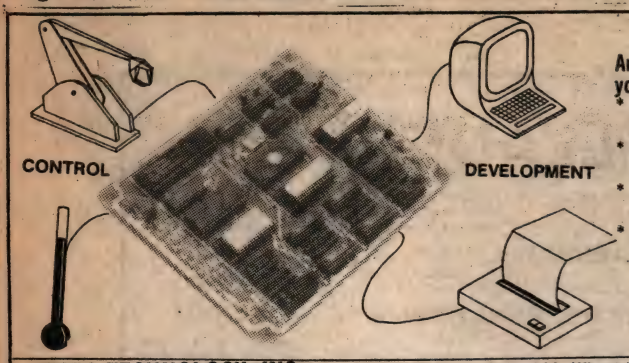
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Quantumlink
continued from page 117

entertainment news, and fun items. None of these is a "plus" service, so you have unlimited access to all of them at no added cost per month.

3. *Customer Service Center*, for system news, suggestions, and billing information. None of these is a "plus" service.

4. *Shopping Center*, where you may shop in Comp-U-Store on-line as a "plus service."

5. *Commodore Information Network*, with SIGs for 64, 128 and Amiga; a conference center, a hotline, and a user group forum (some "plus," some not).

6. *Learning Center*, providing Academic American encyclopedia and the Electronic University catalog at no extra costs.

7. *News and Information*, featuring USA Today evening update at no added cost.

In addition to these eight areas, on-line messages and E-mail are available from all services without added costs, so users have unlimited access to these. There is no additional charge for 1200 baud, and you will find very up-to-date information on all Commodore products and very nice database libraries (similar to what used to be free to users of CompuServe). The drawbacks are: the system is very, very slow (see article on the Commodore Press Conference by Stan Veit); you are restricted in what you can save to disk; there are numerous "plus" services which will cost you extra; and you must have access to Uninet or Telenet to get on Q-link. Many areas of the service are not yet operational, as you can expect some disappointments when you go to access an area not yet in service, but this also means that Q-link is dynamic and growing, providing several new and exciting opportunities not available to other computer users. Remember, this is a Commodore service, exclusively for Commodore users, so you will not have to compete with your friends with IBMs, Apples, Ataris, etc. Two of the nicest things about Q-link are the custom service forums and the monthly calendar which comes to each subscriber. Forums give insight into all sorts of topics, including AMIGA, C-128, Graphics, movies, and guest speakers, to name a few. The calendar keeps you posted on the key events and the times you should be on-line to take advantage of them.

Perhaps the most unique service offered by Q-link is the QHELPER and QGUIDE feature, which provides personal, live help and guide service directly to you, anywhere in the service area and at any time you call for it. I found this indispensable as a new user, and the people were super! As you become more familiar with the system, these assists will be less needed, but it sure is a welcome change at the beginning. If Commodore and the Q-link people can iron out the system bugs (and, there are some at this time) and overcome the issues which "plus" service charges are going to bring up, this could be *THE* best on-line bargain for Commodore users. I wish them the best.

You can reach Q-link toll free at 1-800-392-8200.

128 Internals by Abacus Software

One of the best of the new publications for Commodore machines is "C-128 Internals" by Abacus Software. More like a programmer's reference guide than an operator's manual, *C-128 Internals* provides an excellent tour of the

continued on page 124

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An (Un)Biased View of Viewtron

by Cheryl Peterson

Now I'm not going to try and sell you on the fact that my opinion of Viewtron is unbiased. In fact, I'll come right out and admit that I'm one of the new Sysops hired by Viewtron to help change a struggling local enterprise into a thriving national information utility. While you would think that this should be an incentive not to point out any of Viewtron's deficiencies, I don't work that way. Anytime I look at a product (any product) that I'm asked to evaluate, I look for its good points and its bad points. Before I became a Sysop I was invited to do just that. Evaluate Viewtron, see where it needed improvements, suggest those improvements and decide whether I wanted to be a part of it.

After taking a tour of the building where Viewtron's computers are housed, trying the system out on a Commodore computer and spending three days in conference with the management of Viewdata, I decided to sign on as a Sysop. One of the biggest reasons for my decision was the group of people who had been gathered to form the Independent Commodore User Group Sysops. One of whom, I am.

The head of our group, Deepak Midha, is no newcomer to Commodore products or telecommunications. A long time resident of CompuServe, he has been around modems almost as long as modems have been around. A former upper management employee of Commodore, Midha is well versed in Commodore business practices and maintains contacts within the company to keep informed new projects and plans.

Many ICUG members have worked as Sysops for other information services, including Delphi and CompuServe. To those who have spent considerable time on-line in the last few years, their names will not be new. (See accompanying list.)

While the people involved are a tremendous recommendation for the system, the competition has a good head start. What is there to recommend Viewtron over the older services? Besides ICUG (and that is a big factor, when you consider the expertise of its members), Viewtron has one very big recommending aspect. It is very easy to use.

To understand why this is, you need a little background on the company. Originally designed to be a page oriented, graphic videotext service, Viewtron presents information on pages much like a newspaper. Using $600 Sceptre terminals provided by AT&T, Viewtron was designed for people unfamiliar with computer use. Knight Ridder, Viewtron's parent company and owner of the Miami Herald newspaper, first conceived Viewtron as an electronic newspaper or magazine. They intended for their customers to read it just as you would a newspaper, but with the added feature of being able to use a computerized search system to find the articles you wished to read. Using keywords like sports, movies, top news, stock quotes and local news, it would be simple to find information.

In its original incarnation, Viewtron was designed to be a local service for south Floridians. By including "home banking and shopping services," it made life easier for its subscribers. Many local department stores maintained an on-line catalog from which merchandise could be purchased at the touch of a few fingers. The computerized banking gave an up-to-date balance in an instant and simplified check writing. Combined with automatic teller services just coming into popularity (this was back in 1983-84), one need never go to the bank again and still have instant access to their money.

Despite its being very easy to use, this entire network of services was based on a local market and as such was doomed to suffer low membership. Though the Sceptre terminals were designed to be simple, the non-computerists feared the unknown and wouldn't run out to pay a non-refundable $600 fee for a little box they might not like to use. The computer users who were already primed to accept such a service, could not access it via their home computers. And they sure weren't going to pay $600 for a computer that you couldn't even hook a printer up to. A clause in the agreement that originally formed Viewtron prohibited Viewdata from even considering home computers for the first three years in business.

Because of this the local users who most wanted to access Viewtron, could not. After three years in business, Viewtron had less than 3000 paying customers. Changes were in order! First they announced

continued on page 122

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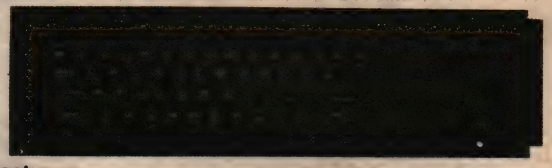
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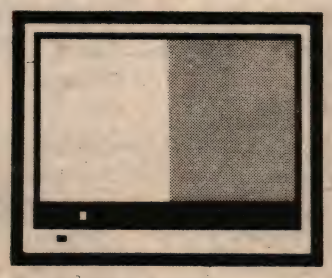


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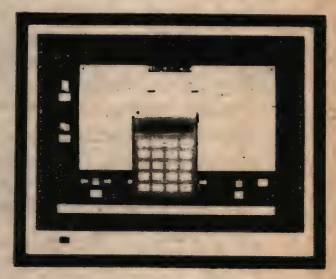
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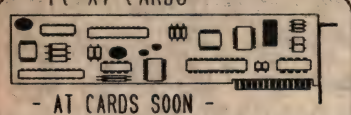
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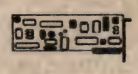
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(Un)Biased View

continued from page 121

starter kits, manuals and software for Apple and Commodore users, to be given away! Anyone could get the software. All that was needed to get on-line was the software and a valid credit card number, American Express, Visa or MasterCard. Their user base doubled in a few weeks.

Then they announced their plans to go national. Shortly after this ICUG was formed to give Commodore users a special place on the system. This is where I officially came in. I'd been following Viewtron's progress since it's inception and had even contacted them about doing an article on some software that was being marketed in Canada. Not knowing about AT&T's clause, I had asked whether a Commodore 64 couldn't access Viewtron using a NAPLPS decoder with a 300/1200 baud modem. I could get no cooperation from Viewtron and so wrote the service off as doomed to die an early death, because of the short-sightedness of the company.

With the announcement of Commodore 64 access, though, my interest was rekindled. By a short series of coincidences (otherwise known as persistence), I became acquainted with Deepak Midha and ICUG. I still wasn't sure Viewtron could fly, but we're giving it our best shot.

Since it was not originally planned to be used with home computers, Viewtron doesn't use the ASCII standard that we are all familiar with. Instead it uses the graphics oriented NAPLPS standard. This means that much of the information taken from Viewtron is in an unusable form. The Viewtron software will allow you to download "screens" of information and save them to disk. These can be viewed later using the Viewtron software.

A print function is also provided, but it will only work quickly with a Commodore printer. Although a printout is possible using third party printers, instead of taking twenty seconds they take anywhere from three minutes to twenty-three minutes. In addition, it will only print exactly what appears on the screen. You can not take the information and use it with a word processor or other program.

The last major complaint about the system is its speed. While it has some wonderful convenience features that make it much easier to use than other services, it is also terribly slow. At 300 baud, it seems that it takes forever to "paint" a screen. In menu driven areas, where you MUST wait for the screen to finish before you can choose an option, the waits can get tiresome. However, at 1200 baud it is much more tolerable, and if you use a 1200 baud modem you are not charged extra. (Unlike many other services which charge twice as much for faster access.)

Now that you know all the difficulties of Viewtron (which the ICUG Sysops are fighting to get changed), here are the advantages. 1200 baud at no extra charge has already been mentioned, but where this really comes in handy is in the software libraries. The Viewtron software includes a download routine that makes obtaining public domain software as easy as "Find and Press," two keys. Also finding a program you want is very easy.

The software library is divided into sections by type of software; music, graphics, games, education, home, business, etc. These categories are further divided into topics, and the programs are presented in menus on a page. To find out more about a given program, you type its menu number. This calls up a description of the program and the options: to download; or to access; read the user comments area. To download, you choose the appropriate option. Before starting the download, Viewtron asks if you have the right disk in the drive. You place a formatted disk (not the Viewtron disk) in the drive and hit Y to begin the download. Control 2 stops the download, if you need to quit for some reason.

The entire process is automated. You can walk away and if you're gone long enough, you'll be greeted by a screen saying that the download is complete and telling you the number of blocks transferred. Unfortunately, disk errors that may have occurred during transmit won't be reported, so you'll need to check to be sure the program works. It really is simple to use.

The user comments section is a neat feature. In deciding which programs to download, you can read comments left by other users about the programs, or you can leave your comments for others. A duplicate of this area is available in Protecto Enterprises software buying section, so you can get hints about commercial software as well. Since there is no extra charge for using 1200 baud, the software library may be one of the best sources of Commodore public domain software. Another good place to find both software and hardware is Bidquick. Computer Bidquick is an on-line auction service in which the prices start at about 80% of list and drop every 15 minutes until someone buys the

continued on page 128

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Book Shorts continued from page 116

many of the features of popular commercial programs, as do the data manager and check book programs. The backgammon program is not meant to take any championships, but it's a good way to familiarize yourself with the game.

The rest of the book deals with other software that can be purchased to accomplish various tasks. The authors mention public domain software and where to get it, as well as recommending various commercially marketed packages for differing applications. Though I haven't used all of the programs they recommend, the ones that I am familiar with are all good buys.

It is even well indexed, so when you have a question about using one of the programs, it doesn't take all day to find the answer.

For someone just getting started with a Commodore or on a limited budget, this $19.95 book is a great deal.

The Commodore 64 Family Helper Super Software For Home Management
Richard F. Daley and Sally J. Daley
Scott, Foresman and Company
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1900 East Lake Avenue
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Einstein's Beginners' Guide to the Commodore 64

This book is one in a series of books put out by a company long known for its educational materials. HBC has been one of the primary marketers of classroom textbooks for decades. While this book is comprehensive enough to fall into that category, it is a bit more interesting than I remember my school books being.

While the writing is cutesy, it is none-the-less informative. The author takes a fun approach, while still maintaining the form of a learning environment. Everything is presented in a step-by-step, "work along with me and we'll learn something" atmosphere. The book is chock full of sample programs and still manages to keep a fun tone.

Instruction in graphics, sprites, sound and just about every BASIC function imaginable make it a complete course in BASIC programming.

Glossary and index and (believe it or not) test questions with answers at the end of the book make this a good learning tool. The appendixes repeat much of the information that is found in the *Commodore 64 Programmer's Reference Guide*, but it is always nice to have the information close at hand. If it isn't being used in schools, it should be.

The $7.95 price tag makes it an excellent buy.

Einstein's Beginners' Guide To The Commodore 64
Jeff Einstein
Harcourt Brace Jovanovich, Inc., Publishers
1250 Sixth Avenue
San Diego, CA 92101
or
111 Fifth Avenue
New York, NY 10003
$7.95

The remaining four books are all from Abacus Software, which as a general rule markets some very good books dedicated to the Commodore computers.

Tricks And Tips For The Commodore 64

This is one for the more advanced Commodore users. It includes handy tips in assembly language, BASIC and FORTH and CP/M programming. This book is one of the few that devotes any space to programming with the CP/M cartridge marketed by Commodore.

It includes instructions for addressing external devices via CP/M by using the user port as a centronics port. Hardware specifications for this application are included, as well as the assembly language driver for CP/M and attendant BASIC routine.

There are numerous short BASIC and assembly language routines included. If you are really interested in improving your programming skills, this is an excellent way to do so.

Tricks And Tips For The Commodore 64
Abacus Software
P.O. Box 7211
Grand Rapids, MI 49510
(616) 241-5510
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Adventure Writers Handbook For Commodore 64

Here's a fun little book. If you've ever wondered about the kind of programming needed to create your own text adventure game, here's how to find out. Taking a step-by-step approach, you actually create your own adventure as you read the book.

You create a world to explore, with text descriptions for each location. Objects can be addressed at various locations and various actions can be performed with the objects. The program you design keeps track of players progress and also includes procedures for saving your games and resuming later.

There are four programs included in the book; two adventure games (Gold Fever and The Enchanted Castle) and two utility programs (Adventure Editor and Adventure Interpreter). All in all, not a bad deal at $14.95.

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continued on page 124

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Book Shorts
continued from page 123

The 1541 Repair And Maintenance Handbook

There is nothing fun about this book, but its usefulness more than makes up for that. The book actually teaches the reader how to do minor electronic repairs on the 1541 drive. It starts by detailing the normal maintenance procedures that can prolong your disk drive's life. Included in this section is periodic cleaning and alignment checks. From there it goes into some of the more common problems that can develop.

The book is written for those who are not already well versed in electronics. There are simple circuit diagrams and numerous other illustrations to help the novice find his way around inside the drive. A complete explanation of the differences between the drive models. The authors are careful to warn of static electricity's potential for mischief to the ICs on the PC boards.

Alignment, speed adjustment and read/write test programs are included. A parts list in the back gives the numbers needed to order replacements from Commodore or a third party vendor.

It is recommended that an oscilloscope be used to perform some of the work, but there is still quite a bit that can be done without the expensive test equipment.

The 1541 Repair And Maintenance Handbook
Abacus Software, P.O. Box 7211 Grand Rapids, MI 49510, (616) 241-5510, $19.95

Commodore CAD Computer Aided Design For The 128

This is one for hard core BASIC programming folks. It includes extensive (very long!) programming modules for drawing design diagrams. It takes a rather piecemeal approach that is intended to allow the reader to design the system that would be most useful for his application. A linker type program is used to pick modules from a menu for specific drawing needs.

This book is not designed to let the average user just start doing wonderful drawings. Rather, it uses the modules as demonstrations of ways to approach specific problems.

The modules can be used with a Commodore 64 provided the 64 is running Simon's BASIC.

For those who are interested in custom designing a CAD system that will address their specific applications, this is a good learning experience. Others who want to learn more extensive programming techniques will also find it useful. The average BASIC programmer however, may want to pass this one up until he can "grow" into it.

Commodore CAD Computer Aided Design For the 128
Abacus Software, P.O. Box 7211, Grand Rapids, MI 49510, (616) 241-5510. $19.95 ●

Quantumlink
continued from page 120

inside of the Commodore C-128. It begins with all the pin-outs for the I/O ports, giving signal levels and line uses; moves on to very complete and exhaustive discussions of each of the chips in the machine--the VIC chip, the SID sound chip, and the VDC video driver chip; and continues on to describe the new Memory Management Unit (MMU) and all of the Kernal routines, the Z-80 ROM, and the *Total* Kernal ROM listing.

For anyone doing serious programming, this last item is given all of the eighth chapter, with over 250 pages of listings and detailed descriptions of what each does. *C-128 Internals* is not for a beginning user, but it will be indispensable for a C-64 user upgrading to the C-128 and willing to explore the differences in the machines. It will be possible to rework your existing software in many cases using these descriptions to adapt to the C-128 mode. You will also find it useful to understand clearly the routines available to you and the way in which they are employed. The token table for BASIC 7.0 and descriptions of two character sets are included, along with the keyboard matrix and internal board layouts of all the parts of the machine, coded by mode in which they are active.

To give you some idea of the completeness of Kernal documentation, here is an example from page 321 of the book. If you are as frustrated as I am about the lack of modem access for the C-128, there is some help here:

```
;*********************************  GET RS-232 if buffer empty
E7E4:  09 08      ORA  # $08  Set bit 3 (marker - buffer empty)

E7E6:  8D 14 0A   STA  $0A14  In RS-232 status

E7E9:  A9 00      LDA  # $00  Pass $00 as character read

E7EB:  60         RTS         Return from subroutine
```

This is just one short routine. There are several hundred done just like this for every Kernal call. With over 250 pages of entries like this, including descriptors on each line of code, anyone even half inclined to do programming will be greatly encouraged!

There is a hardware discussion in chapter nine giving a description of how the chips interact in each of the three main C-128 modes. If you need to understand how the machine works and how it must be "talked to," I can recommend *C-128 Internals* without reservation. I know of no other publication giving such a complete coverage of the Kernal--the heart of this Commodore product--and at $19.95 it represents an excellent value. Knowing the "how" of addressing routines will advance your programming capability and allow you to take full advantage of some very powerful commands built into the C-128. If you want to program, you will want to have a copy of this book at hand.

C-128 Internals
Abacus Software
P.O. Box 7211
Grand Rapids, MI 49510
$19.95

These are just three examples of the many new support items becoming available for Commodore users. Even if you have no new hardware, there is enough new and exciting software and subscription service to begin again in enjoying your machine. I look forward to many more items in the next few months and hope to be able to report on developments for AMIGA soon. ●

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The Silver Box
continued from page 70

two different motor designs. One design uses a monostable oscillator to generate the reference frequency which is divided down to kilohertz range. The output of a frequency generator placed on the circumference of the motor has direct relationship to the motor speed. If the frequency is lower than the reference frequency the motor speed is increased.

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The other design approach of the direct drive motor uses a crystal or ceramic resonator to generate a stable reference frequency and in this design you must replace the resonator with one exactly 44% lower in frequency.

In both designs if you run a pair of wires to the front of the computer and connect it to a switch with a few components to it, you can change the motor speed at will.

Software For MIDD Format

I would like to explore what we could do about the DOS and the formatting program to create the MIDD 13 sector disks during next few months. I will report to you whatever progress I have made in the months to come.

More About Sanyo

I have described so much about NEC in one of the preceding paragraphs so now it is the Sanyo's turn.

You don't see many MBC-885, the IBM PC compatible, in your neighborhood. I don't. The Taiwan clones, the pack of the "Clumsy Clone" has exterminated all other low cost compatibles from the hobby market. The penetration into real business market is somewhat doubtful but the pack has practically killed off all other low cost compatibles for good. The MBC-885 has surfaced in Japan with the price tag of $2,300.00 in an advertisement appeared in one of the leading computer magazines.

The MBC-5800W For Japanese Market

This is a CP/M86-MSDOS (V2.1) machine with an 8 octave 3 channel sound generator and voice synthesizer. It is bundled with a Japanese business software called "PACK-ONE." With two 1000K drives it is listed for $1,900.00. It looks about the size of an IBM PC with an audio volume control on the front panel. Nothing else is known at the moment.

I want to see this one combined with two DSDD 360K disks. The total disk storage becomes 2.7 Mbytes and should be adequate for a small business, employing less then ten. There are no four drive PC compatibles in the market. I now use one 96 tpi external drive placed on the side of the monitor and thinking to add one more of 360K type. This additional 96 tpi is very handy in making backup copies.

Of course the MBC-885 can be also converted to use these two different pairs of drives, which I nicknamed as Sanyo QUADLA(tm). If Sanyo would let me sell this model with a little ad budget, I may corner the small business corner. It should sell about 700 units a day in this country, a mere 14,000 per month. I want to retain the title to the name I invented though.

The Sanyo RAM Expansion Board

I almost forgot to tell you that I still don't have the RAM Expansion Board which was supposed to be sailing into U.S. port around November 25, 1985. I made a last minute phone call to Sanyo but the line was busy. However, I just got a shipment of 256K RAMS for experiments. The conversion shouldn't be difficult but cutting of printed wire traces and hand soldering of wires may be inevitable. You will see what I have done with them in the coming issues. The problem is that I will have to write this column on my "Clumsy Clone." During this operation the "Silver Box" cannot function as a computer when the CPU board is taken out of it.

The Protection Racket

I remember reading in some trade articles that the Master Piece surge protector from the Kensington Microware was the best selling product for some

continued on page 130

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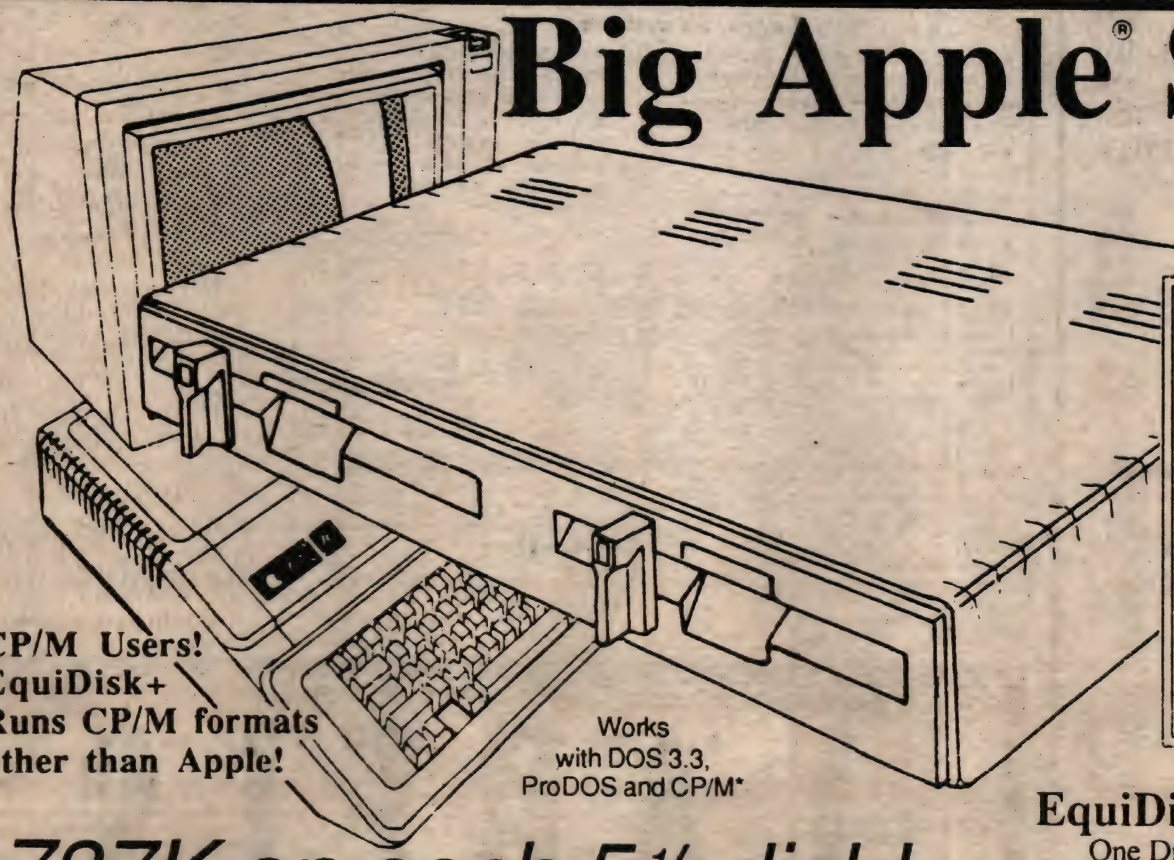
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Mindwheel Review

by Cheryl Peterson

Mindwheel is the first in a series of programs that Synapse calls "electronic novels." Having played a number of text adventure games, it was nice to see that improvements are constantly being made. Mindwheel is a great example of taking a good idea and making it better.

The game starts with reading a few chapters in an incomplete book. The book gives the background of the game and steers you along toward the point where the game starts. There are clues hidden in the book as well as in the game. Blank pages at the end give you somewhere to take notes on your progress.

The plot line involves traversing the minds of four long dead prominent historical figures. (Be aware though that Mindwheel's universe is not ours and none of these people will be known to you, except through their brief descriptions in the book.) Each mind has a terrain occupied by folks who may or may not be friendly. And goals must be accomplished to go from one mind to the next. All four minds are interwoven. Finding the doors between and the way to obtain the Mindwheel and use it are very complicated.

Where most text adventure games limit players to picking up or dropping items, looking around at the scenery and making a few key moves toward winning the game, Mindwheel has a few curves thrown in and avoids too many obvious solutions. Oh, surely some of the problems will seem simple to the more experienced gamesters, but they do get progressively more difficult. And the interaction with the game is not limited to single person perspective. Mindwheel's characters have their own perspective and opinions and when asked will give you information you may be able to pick up nowhere else. The variety of characters and their reactions to the player are very interesting.

In addition, Mindwheel has a very good parcer. The permutations that can be made in giving commands to the program are great. But, even better are the wonderful ways in which the program says that it doesn't understand what you're trying to say. Besides saying, "The word XXXXX is not in Doctor Virgil's technology," at key places it will say something like, "Nice word, but it won't help you here," or "I'm just a lowly political prisoner and have no idea what an XXXXX is." Some of the interactions with the characters in the novel are really outrageous.

Mindwheel even has a couple of characters whose only purpose seems to be to save you, should you do something stupid and get your self caught in what appears to be an inescapable trap. Typically, when you do something really stupid in an adventure game, there's no way out except to start over.

Like all good adventure games, this one will allow you to save your game at any point to resume it later. Mindwheel equates this with using a bookmark in a real novel, so the command is called bookmark. Well prompted, with an abort feature, it's a little better than some other games in this area. Your position and status are saved on a separate blank disk, allowing eight games to be stored simultaneously. It asks before overwriting a previously saved game.

Is it perfect? Well, close. The Commodore version which I used is on three disks. The disk access time being what it is on the Commodore, the game can drag at times. The game always repeats the surroundings, no matter how many times you come into an area. This can get grating as the winged woman asks you to

continued on page 130

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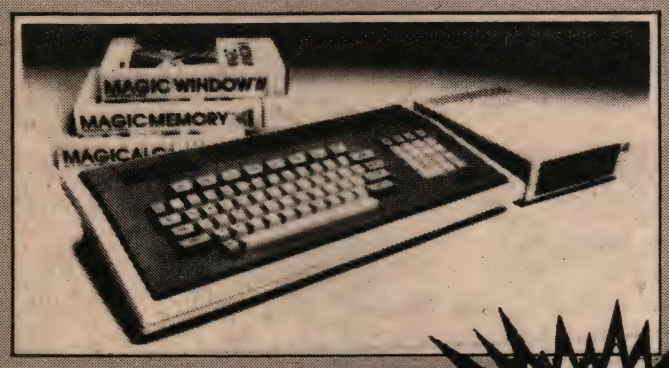
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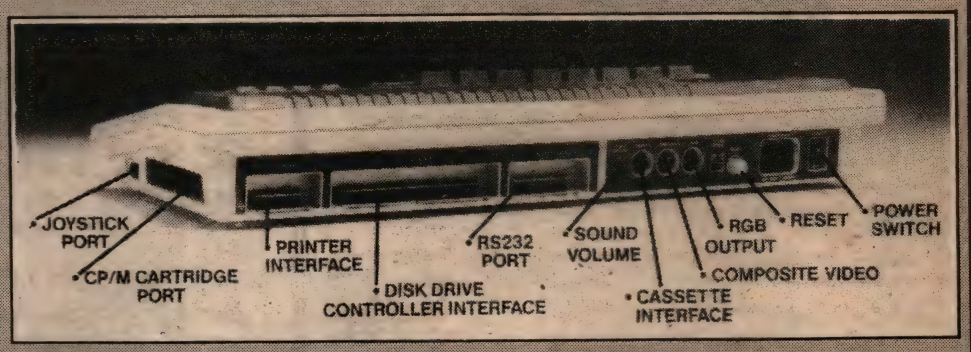
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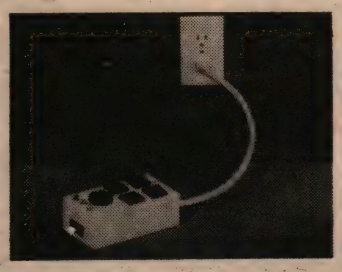
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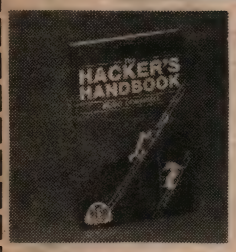
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(Un)Biased View

continued from page 122

item. There are complete descriptions of the items up for bid, as well as a listing of products scheduled for bid. Rather than waiting for items to drop to the price you want to pay, you can leave a floor bid. A floor bid is the price you are willing to pay if the item should drop down that far. The current highest floor bid is shown on the description page.

Viewtron now has three Bidquick sections; the Commodore Bidquick, an Apple Bidquick and a general bidquick. The general bidquick features items like videotapes, televisions, cassettes, home appliances, laser disk players, cruises and other travel items, etc.

In addition to Bidquick, Protecto Enterprises maintains an on-line catalog of computer goods that can be purchased directly using your VISA or MasterCard. And numerous other stores, JC Penney and Sears spring to mind, have on-line catalog ordering using their credit cards. Some of the novelty items that can be purchased through Viewtron have to be seen to be believed.

As a source of news, Viewtron has the benefit of the Knight Ridder news service to provide up-to-date articles on general topics. While it's computer related news is VERY limited, Viewtron does have on-line software reviews courtesy of *RUN* magazine and the *Book of Commodore Software* reviews. These reviews are searchable by software name or through topic menus.

There are on-line games and educational programs, as well as the Grolier Academic Encyclopedia. Viewtron has clubs for adults, teens, children and many hobbyists. And of course, there's a CB simulator.

But for Commodore users the big news has to be the SIGs (Special Interest Groups). At the moment, there are three active SIGs; Speakeasy, For Starters and Inner Works. Plans are in the works for five more. Each is aimed at a particular type of Commodore user, although their areas of interest sometimes overlap. Each SIG has a bulletin board, its own private 5 channel CB, a lookup section where users can find out about each other, a bulletin to tell new users about the SIG, and a description of the Sysops. Schedules have been established to let members know when they can expect to see their Sysops on CB, but many hang around in their "off time" as well. Parties are thrown for special occasions like holidays. Door prizes are even given at odd times.

Speakeasy is the gathering place for the absolute non-technical, computer user. Not that experienced users don't drop by, but the tone of Speakeasy is a more general, playful atmosphere. Concentrating on fun or creative endeavors like writing group created on-line novels, Speakeasy is a place to make friends and have a laugh or two. One whole section of the bulletin board is devoted to jokes. The CB features Ishtar's Hot Tub nightly and trivia games regularly.

For Starters is the SIG for beginning computer users who are looking for specific ways to use their computer. Help with very basic BASIC programming, printer interfaces, software, or any other problems users may have can be had for the asking. Of course, the Sysops don't know everything and don't profess to. But maybe one of the other BBN users will have the answer you're looking for. The Sysops of For Starters (and that includes me) can be found hanging around in the CB section. I'm in on Saturday nights from 8 to 11 and sometimes hang around in the early evenings.

We've recently added an astronomy thread to our BBN and have special CB meetings, as well. We are always searching for new ways to be useful to our members. Since I'm familiar with CP/M, there have been a few questions about it. We do have a CP/M thread running on the BBN, so there's a place to leave your questions.

Inner Works SIG is for hard core computerists who are into programming and serious "guts of the machine" type activities. This is the place all the hackers gather and compare compilers or trade routines. Both of the Sysops of Inner Works are hard core hackers. Joe O'Hara is president of the company that markets Sixth Sense (a popular C64 terminal package). Larry Phillips, a Canadian who has been using Commodore equipment since the early PETs came out, is a proficient on many different Commodore computers.

Future SIGs will feature user group support, music, graphics, and games. A special SIG is being planned for commercial Commodore product developers. By the time this article is in print the other SIGs should be up and running.

As you can see, my working for Viewtron does little to prevent me from mentioning the negative aspects of the system. Of course, in the two months between writing this and its appearance, we hope to improve all the things that aren't quite the way we'd like them to be.

And we do have a lot going for us. Viewtron may be the baby in the market, but we think it will be the best videotext service available in no time at all. And for Commodore owners, it's a dream come true.

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Viewtron Sysops, Videotext Services Corp. Deepak Midha - Chief Executive Officer, Kate Kassouf - Chief Operations Officer. **Sysops of For Starts SIG** Cheryl Peterson, Jim Lee and Jim Luftman. **Sysops of Speakeasy,** Marte Brengle and Joe Carra. **Sysops of Inner Works,** Joe O'Hara and Larry Phillips.

Other Sysops at large who will soon have their own areas: Brian Gillespie - Games, Libby Morehouse - User Group Support, Dave Shmoldt - Music, Jon Hochberg - Graphics. ●



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Mindwheel
continued from page 126

free her every time you walk by, etc. Other residents repeat themselves whenever you run into them, as well. One annoyance with this is that when the screen is full of this useless data, the game pauses and waits for keyboard input before continuing. (Figuring that you want to read it all again.) The character represented by the key you press, then appears on the screen requiring the use of the delete key to get rid of it. I did find that using the *RETURN* key solves that inconvenience.

Time passes whether you do anything or not. (Provided the game isn't at a PRESS ANY KEY TO CONTINUE prompt.) If you sit around thinking too long about your next move, the computer just goes on without you. Fortunately, this can be stopped by using a pause command while considering your next action.

There are plenty of puzzles, problems to solve and actions to try out. With an unusual plot and interesting characters, I have to say that is an improvement over the more simplistic games that are being marketed by some of Broderbund/Synapse's competition.

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The Silver Box
continued from page 125

months in the computer shops. I have especially bad, bitter memories regarding destructive transients. During the 1982-1983 period I worked in the Northwest suburb of Chicago as sales manager selling computer related products for a Japanese company. At that time I had just acquired my first personal Wordstar Propac program for my S-100 Z80A machine.

In that memorable day the clouds were low and it was very dark. The Northwest plains of Illinois were being submerged by a lot of rain and any tall structures were being bombarded by countless discharges of electric energy. The thunderbolt hits the ground only when large raindrops are coming down with each drop carrying substantial electrical charge.

In order to ionize the air and create a conducting path between the cloud and the ground, a distance of perhaps 3,000 feet, a certain threshold in voltage has to be exceeded. Pure water is a bad conductor, but water vapor and rain drops in the air increase the capacitance between the clouds and the ground appreciably. In addition rain water is not really pure since it has been tossed around in the clouds and has absorbed whatever dirt it can absorb from the surrounding air. This also lowers the threshold voltage necessary to ionize the air. The spaces between the rain drops can be considered to constitute a series of gaps which will break down at much less voltage than a big single gap.

To break the distance of 3,000 feet requires about 600 mega-volts. Let's assume that the capacitance of the cloud is 0.003 micro-farad. The stored energy W in this capacitor can be calculated using the formula, $W = \frac{1}{2}C(V^*V)$. The W is 5.4 x 10 8 = 540 mega (watt-seconds) which is in terms of KWH, 1500. Imagine this much amount of power being injected to your power line in less than one second! If the cloud is higher than the assumed 3,000 feet, then the lightning voltage could be higher resulting in the square of the increase in power. With rain drops present the real charge voltage could be lower than our assumption. With heavier concentration of the rain drops per cubic centimeters of the air, the frequency of lightning hitting ground could be higher but each thunderbolt carries less energy because of the lower ionization voltage required.

After three hours of heavy thunder in the vicinity, a big one hit the pole on the corner, about two hundred yards from my glass door across the open field. This burnt a 15000 volt line, sending one end of the line to the pavement below. Every time a passing vehicle splashed the ebbing water on the pavement, a flame about 9 foot high went up into the air burning more tar and creating deeper craters on the road surface. The maintenance people could not touch it. Unless the thunder stopped completely

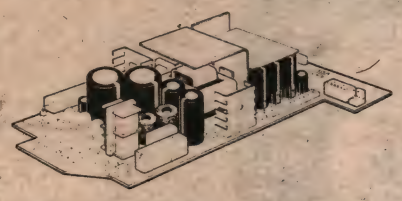
continued on page 131

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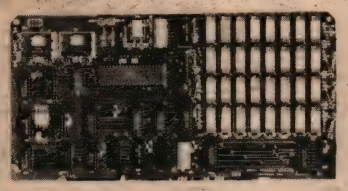
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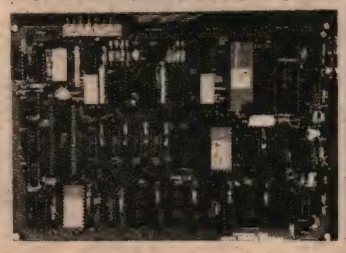
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The Silver Box continued from page 130

they could not work on the downed line. None of their equipment could withstand mega-volts of transients. Several hours later they cut off the offending line. The rest of the repairs were done the next day.

After the long wait since the morning, I finally switched my computer on, and then, within a few seconds of the fateful operation a lone lightning bold illuminated the field outside.

My Nature Boy was dying. (Nature Boy is my several year old S-100 computer.) It was never cased, remaining naked since it was born. I have learned how to write a monitor program on him. I had struggled with the alien disk control board for three months in the summer of 1979. I practically memorized all the wiring in it. I had to learn how to treat disk IO. I head-assembled the codes, wrote several versions of CP/M primitive BIOS using ROM monitor, until the final day the CP/M has assumed the control of the computer for the first time. That was an experience not many people have nowadays, to enjoy and enrich his hobby. In any case the EPROMs developed some errors in reading them, which cured eventually several hours later but the RAM board had lots of damaged chips.

I should have, and all the computer engineers should have included a suitable surge suppressor (which is nothing but a 30 to 50 cent component), colored black or red, in the size of a quarter with two leads attached to it. This is a component called a varistor. Some computer engineers thought 30 cents was too high a price to give out free protection in a $3,000 computer. In the summer of 1980 all other computers were built the same way following the lead and the users had to buy surge protection paying $25 to $1100. I recently opened a brand new 63.5W power supply for the computer. It still has no protection inside.

The real price you pay for such protection differs somewhat in circumstances surrounding your purchase. You may pay $2.50 each if you are an end user and buying in quantity of one. You pay 25 cents each if you are an equipment manufacturer and buying 1,000,000 pieces or more. You might pay 50 cents if you are in between these two categories of buyers and building 500 computers a month. Some people paid $100 for a so called surge suppressor, a box with many lighted switches, a line filter and a varistor, in which the whole surge protection is provided by this 50 cent component.

Without the varistor this assemblage of switches, sockets and housing could be called a power distribution box which may be worth to most people no more than $25 to $35. The addition of a varistor changes the name from power distribution box to a somewhat important name of a surge protector for which people have paid $65 to $75 more. In a sense you can say a single varistor is marketed for more than 100 times the cost!

The Varistor

You can buy zinc oxide for 15 cents per pound. You might need some other ingredients to be mixed in such as talc, Magnesium oxide and Manganese dioxide powder. Make a paste out of them and fire it in a furnace after molding the paste into numerous quarter size disks. You put electrodes and a wire on each side of these disks. Viola! you have a Varistor of sorts.

The real varistor product requires careful blending of ingredients and numerous testing to assure quality and required characteristics. But the basic material is the zinc oxide as explained above.

At a certain voltage level which can be controlled by the additives and firing process the bulk material starts to conduct the electric current and exhibits low impendance of about 1 ohm as long as the terminal voltage remains above the threshold level. If this condition continues for a long period of time, the varistor

continued on page 134

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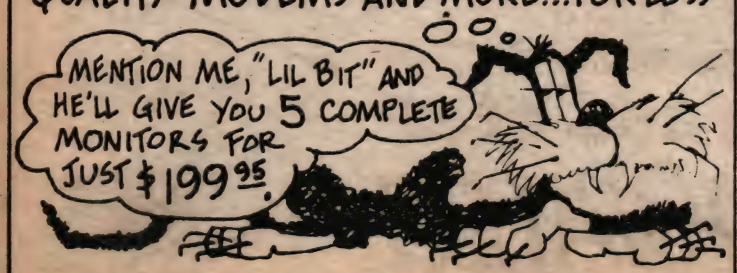
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DataGraph 2001
continued from page 56

watch is available for $119.

The UC 2001 also comes with utilities to read the clock from other programs. An install program will attach the CLOCK.SYSTEM program to ProDOS's timestamp routine. It will work with most programs, but it will not install on many copy-protected diskettes. A special utility, *Clockworks*, is provided for Appleworks. Besides the normal CLOCK. SYSTEM program which lets ProDOS timestamp the Appleworks files, the Clockworks program will enhance Appleworks. Once Appleworks is patched, the time will be displayed on the lower right hand corner of the screen when you are in Appleworks. If you are in the Database section of Appleworks, and include the word "DATE" in a description field and enter in an "@" for the date, the present date will automatically be entered for you. For BASIC programmers, a binary program BASIC. TIME is provided which will read the time into an Applesoft variable or machine language location in either DOS or ProDOS.

This watch could use a couple of improvements, it does not have a back light (a nice feature for liquid crystal displays), and the contrast can only be set by the Time-trax program, it cannot be set from the watch. The UC-2301 interface module works excellently with the Time-Trax program or your own programs, but not as well with other programs. It's routines can be attached to the ProDOS timestamp routine, or programs which specifically support the Time-trax, but if your program looks for a standard clock card, then it will not work with the Time-Trax clock.

How usefu is the watch? I found the schedule functions very convenient and easy to use. It's quite impressive to hear your watch beep, look at it, and see what your appointment is. The watch can even remind you ahead of time. The only feature I really don't use is the memo pad. I can see using the memo pad to supplement the schedule for some data like phone numbers (e.g. the schedule says *Call Doctor At 3pm* and the notepad says *Dr. Linda 555-1212*) but for most notes and memos, I'd rather use a piece of paper.

The UC 2001 is impressive and very fun to use. Besides being a great way to impress friends (Sorry, but I've got to go now, the president wants to see me!) it really is a practical way to keep track of your appointments. Each morning I put my schedule into the Time-Trax program, and download it to the watch. During the day the watch beeps, and tells me what to do. Now if they could only come out with a waterproof version which I can use while SCUBA diving!

Product: Seiko Datagraph 2001

Price: $199 specify whether IIc or standard (II and IIe) version. The Time-Trax program is available without the watch for $119

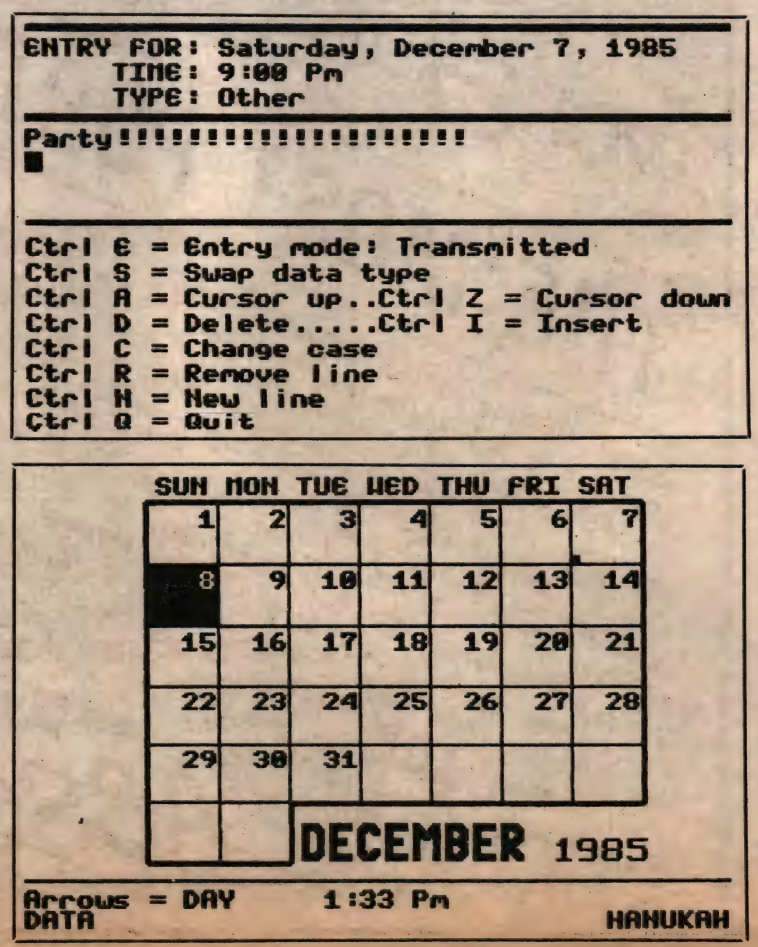
Company: Creative Peripherals Unlimited, 22952 Alcade #160, Laguna Hills, CA 92653, (800) 228-1165 x CA; (800) 533-8997 CA; (714) 770-3334 local

Hardware Requirements: Apple II or Apple IIe. IIc version with a special cable is also available.

Other Products Support: ProDOS attach utility, Clock useable from DOS and ProDOS programs

Warranty: Watch--1 year, Time-Trax program--3 years

Summary: Notepad watch which can receive data from the Apple.



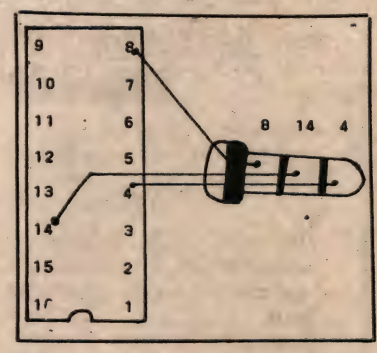
Appendix: How to wire a pass through cable

The following cable will let you plug in the UC-2301 interface module and another device (e.g. joystick) into the Apple's game I/O at the same time. As long as the other device doesn't interfere with the Annunciator 1 location (AN1 $CO5A/$CO5B), or the third switch (PB3 $CO63) there shouldn't be any problems. Anybody who can handle a soldering iron should have no problems wiring the cable. All of the parts are fairly easy to obtain, and should cost under $5.

Parts

16 pin Wire Wrap socket, mini stereo plug, 90 cm. (3 ft) wire wrap, wire wrap tool, solder, soldering iron, etc.

Cut the wire into three equal lengths, and strip the ends. On the Wire Wrap socket, wrap the three wires around pins 4, 8, and 14. Connect to the plug as follows: TIP-4, MIDDLE-14, RING-8. (see diagram) Check all of the connections to make sure you haven't made any mistakes or shorts, and mark pin 1 of the wire wrap socket (I use a dab of Liquid Paper). Plug the Wire Wrap socket into the Apple's Game I/O, pass the mini plug out the back of the Apple, and plug it into the UC 2301 interface module. Plug your joystick (or other device) into the Wire Wrap socket.



If you have the one wire shift mod installed, then make sure that you do not hit the shift key while any program is trying to read the time. If you do, then you'll get the wrong time.

How the pass-thru cable works

The Time-Trax program

continued on page 134

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DataGraph 2001
continued from page 132

"tells" the UC-2301 commands (send the time, reset the watch, data is being downloaded, etc.) through the AN1 location. The Annunciator is turned on and off, similar to sending Morse code by turning a light bulb on and off. The Time-Trax returns the data (time, error codes) by using the PB3 input. Normally these two locations are not used by devices which plug into the Game I/O, so another device can be attached in parallel (the Wire Wrap socket). Even if another device uses the locations, as long as the locations aren't used at the same time (e.g. the shift mod) then there shouldn't be any problems. ●

The Silver Box
continued from page 131

may burn or explode. The amount of energy it can absorb safely is determined by its size.

The varistor I recommended to be used in the last article has a diameter of 23mm and 70 Joule dissipation with breakdown voltage of 200V nominal. This one can handle up to 8 pulses of 6500 peak amps lasting 20 micro-seconds each. This is the largest, self-standing disk type varistors available for general use and has the lowest threshold voltage usable for the power line protection. It will give you the maximum protection you can get from this type of protective device. If subjected to a burst of very high energy such as lightning transients it may short out, therefore, you should place it in circuits protected by a fuse or a circuit breaker.

I have four varistors of this type in my office connected to several different equipment including one power distribution tap. So far I have experienced no unexpected breakdowns of equipment by line transients since I started using them, although I did not perform any real tests to verify the effectiveness of such devices. My wife operates washer sometimes three times a day but my computers remained operable and did not lose any data nor none of my capacitors got fire recently.

One advice I should add about varistor is that you should check the power line voltage periodically. The varistor has the maximum AC rating of 130V AC. If your power line voltage goes above 128V AC at a certain time of day you should call your electric company. At 130V AC a lot of your equipment may overheat and the varistor may start to deteriorate.

Varistors For Readers

I have mentioned the story of the Sanyo AT computer in Las Vegas to one of my friends who happened to handle sales of varistor line for MARCON America Corporation, a TOSHIBA subsidiary. He then offered me to give out 60 pieces of MARCON varistors to our readers to protect their Sanyo against terrible destruction. I offer these to our readers at no cost. Just send your SASE to Richard Fujita c/o *Computer Shopper* with a note. The first 60 lucky people will get the 23G201KM varistor which I believe to have the best specification for the line transient protection.

For the people who did not get it I still recommend to purchase one in an RS store and install it in your computer as described in the January issue of the *Computer Shopper*. Or, you can buy an inexpensive power tap with a circuit breaker and install the varistor inside. It is a very good insurance for your computer which uses series switch type regulator circuit in its power supply. It cost less than 1.70 and it might save your computer from burning out.

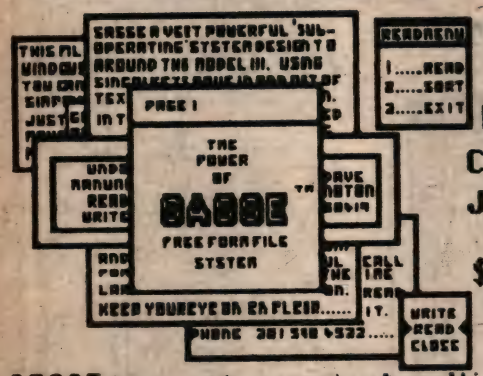
Serial Communications

In one of the column articles I mentioned to describe the serial communication board for the Sanyo in the succeeding column. For various reasons I could not bring it in this column yet. For this delay I apologize to readers who were kindly expecting to see it, but I received only one letter ask-

continued on page 151

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Ask The Guru
continued from page 55

dedicated stand alone computer or controller.

Should your application require some data acquisition, once your data is acquired, you can plug the card back into the Apple and upload whatever it is you just measured.

From a memory mapping standpoint, the VIP memory is split into a "low" 6K and a "high" 2K. The "high" 2K maps into the Apple I/O space from $C800-CFFF. To the VIP itself, this 2K sits from $F800-FFFF, where you would normally expect your monitor, control program, and reset vectors to reside.

The all CMOS design VIP draws little current and is easily battery powered. It is not, however, a micropower controller that will run forever on a tiny battery.

CMOS controller computers have long been available from outfits like *John Bell* and *Onset*. At $129, the VIP compares favorably with these older devices, besides offering the tremendous convenience of immediate Apple compatibility and immediate use of Apple development tools.

There's also rumors of a new 65C02 family single chip that includes multi channel D/A converters, internal stepper driver logic, serial ports, lots of parallel ports, some real time clocks, (and a soft ice cream dispenser.)

Combine this board with the VIP concept, and you'll really have something.

Who Could Use A VIP Computer?

Just about anybody that wants to play with computer control of just about anything.

Let's use our own *Gila Valley Apple Growers* for some examples. I'm extremely proud of all these people, for they are doing some really amazing hands-on computer type stuff.

They're also doing it in a low tech part of the country that is so remote that overnight delivery services take a week and driving to the nearest decent library takes six hours.

While the VIP computer does not immediately solve all of their problems, it sure will be a big help, particularly for initial feasability work. We sure were getting tired of burning EPROMs for each and every code change! We also were getting tired of having a dozen alike-but-different-somehow designs on hand, none of which ever quite got fully debugged.

Anyway, here's a list of what real people are doing right now that involve VIP-like small control computers:

Dave is automating the adjustment of cotton picking machinery by using his small handheld controller that advances a linear stepper used as a micrometer. This very much speeds up the exacting picker shim setting process, besides greatly increasing yields.

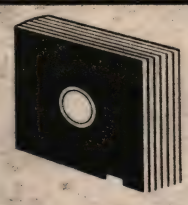
Phil is building intelligent taps for the cable TV system he manages, allowing individual customer services to be remotely switched on and off. Newer and more flexible cable services can now be offered, besides completely thwarting the "midnight pole climber."

Claude is now retrofitting ancient paper tape numeric control machine tools so they become fully Apple compatible. Now the full resources of an Apple, including disk storage, printing, etc., are available to these early tools.

Anne is designing a robotic router for the sign making trade. You simply type in your message, the size, and the type style, and out comes your ready to sell carved wooden sign. *Ron* is doing the same thing for an ultra high pressure water knife used in fabric cutting.

Terry is working up an elaborate control system for a hydroponic greenhouse that involves hundreds of individual water valves. The previously used timers were really raising havoc when they got out of

continued on page 152



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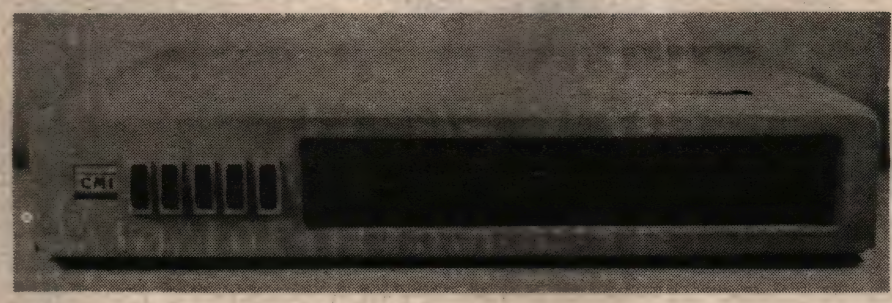
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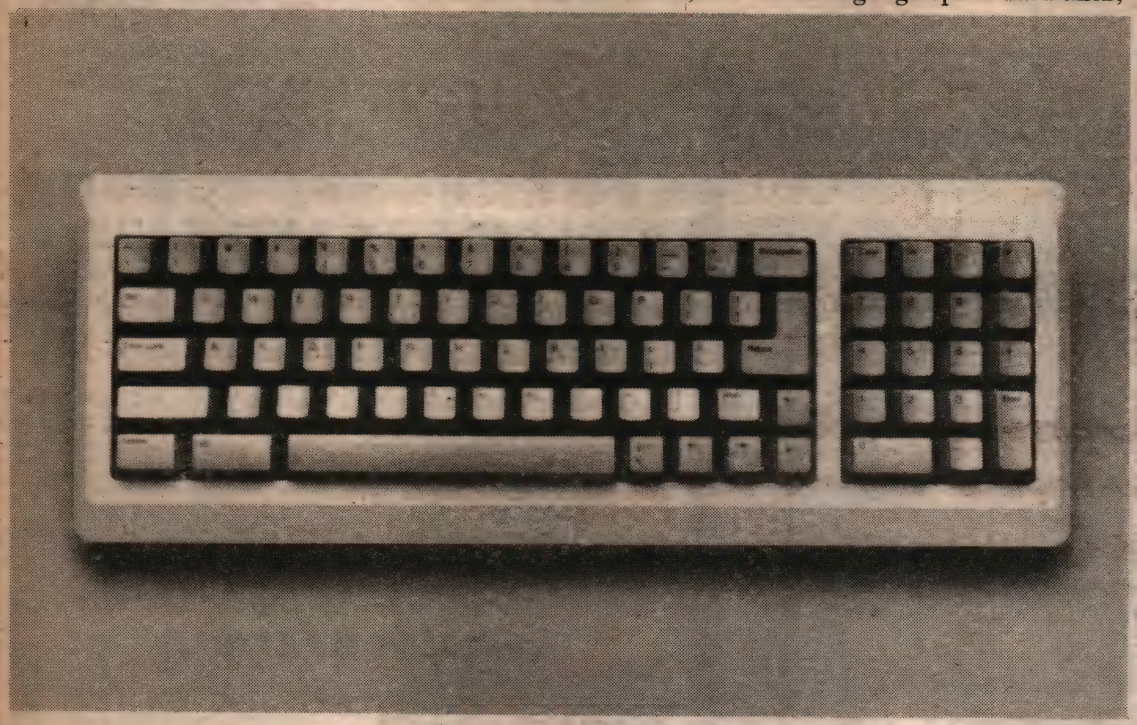
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New Macintosh continued from page 57

reases. Users have the option of copying most Macintosh applications onto double-sided disks.

Macintosh Plus users have a wide choice of alternatives for larger storage requirements. Like the Macintosh 512K, the Macintosh Plus supports the Hard Disk 20 and a variety of third party hard disks. In addition, the Macintosh Plus has a built-in SCSI port for connecting high-speed hard disks, tape backup systems and other peripheral devices. This industry-standard port uses a high-speed parallel interface that transfers data up to five times faster than the standard Macintosh external drive port. In addition, the SCSI port is expandable, allowing up to seven peripheral devices to be connected together and run off the one port. Several companies, including AST Research, Iomega, MDIdeas, Sunol Systems and 3Com, will have SCSI devices available in the next few months for the Macintosh Plus.



Macintosh Plus Keyboard

Special Rebate and Trade-In Program Details

Customers in the U.S. who purchased a Macintosh 128K, Macintosh 512K or 512K Memory Expansion Kit from an authorized Apple dealer between November 17, 1985, and January 15, 1986, are eligible to receive rebates on the Macintosh Plus Disk Drive and Logic Board Upgrade Kits. To receive their rebate, qualified Apple customers must obtain a rebate form from their local authorized Apple dealer, and by May 15, 1986, purchase a Disk Drive Kit, a Logic Board Kit or both and submit their rebate materials to Apple.

Qualified customers who follow these guidelines will receive cash rebates directly from Apple. The Disk Drive Kit rebate is $150, and the Logic Board Kit rebate is $300. The rebate forms are available now from authorized Apple dealers.

In addition, for $1,498, Macintosh XL and Lisa computer owners in the U.S. can trade in their systems for a Macintosh Plus and a Hard Disk 20 through participating Macintosh XL/Lisa dealers. The U.S. suggested retail price of a Macintosh Plus with a Hard Disk 20 is $4,098, so this trade-in program represents a $2,600 cost savings to customers who take advantage of the limited-time offer. This program will run from April 15 through August 31, 1986.

Enhanced Version of LaserWriter Printer

The LaserWriter Plus, like the LaserWriter, prints typeset-quality text and graphics from a Macintosh computer, including the new Macintosh Plus, at a fraction of the cost of dedicated typesetting machines. Unlike other laser printers that often serve as daisy wheel printer replacements, the LaserWriter family eliminates the need to send a lot of work to an art department or print shop for paste-up and typesetting. This gives users the ability to maintain control over the production process, which is critical in office settings where last-minute changes and tight deadlines are common.

LaserWriter Features and Capabilities

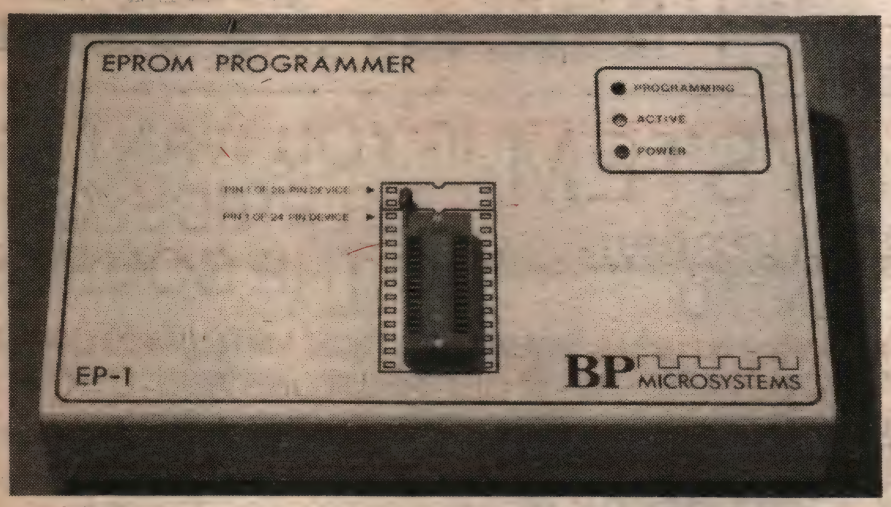
The LaserWriter is capable of printing full-page text and graphics at 300 dots-per-inch (dpi) resolution. It contains a 12 MHz, 68000 microprocessor, one and a half megabytes of random-access memory (RAM), and half a megabyte of read-only memory (ROM). The printer is based on Canon's LBP-CX laser-xerographic engine and Adobe Systems Inc.'s PostScript page description language, a product combination which makes the LaserWriter printer the most powerful system Apple has ever built.

The LaserWriter has the AppleTalk network hardware built in, allowing it to be shared by up to 31 networked Macintosh users. In addition, users of IBM PC and UNIX

continued on page 143

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Generic
2716, 27C16, 2732, 27C32, 2732A, 2764, 27C64, 2764A, 27128, 27C128, 27128A, 27256, 27C256, 27512

Hitachi
HN462716, HN462532, HN462732, HN482732A, HN482764, HN27C64, HN4827128, HN27256

Intel
2758, 2716, 2732, 2732A, 2764, 2764A, 27C64, 27128, 27128A, 27256, 27512, 27513, 2816A, 2817A, 2864

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uPD2716, uPD2732, uPD2732A, uPD2764, uPD27C64, uPD27128, uPD27256, uPD27C256

OKI
MSM2764RS

Rockwell
R87C32, R2764, R27C64, R87C64, R2816, R5213, R52B13, R52B33

Seeq
2764, 27128, 27256, 27C256, 2816A, 2817A, 5133, 5213, 52B13, 52B33, 5516A, 55B33, 5517A

SGS
M2716

TI
SMJ2516, TMS2516, SMJ2532, TMS2532, TMS25L32, TMS2732A, SMJ2564, TMS2564, TMS2764, TMS27128

Toshiba
TMM2732, TMM2764, TMM27128, TC57256, TMM27256

Xicor
X2804A, X2816A, X2816H, X2864A, X2864B, X2864H, X28C64

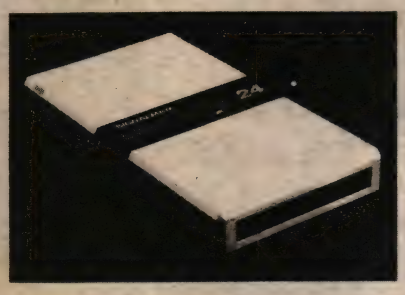
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74LS10	.16	74LS193	.69
74LS11	.22	74LS194	.69
74LS12	.22	74LS195	.69
74LS13	.26	74LS196	.59
74LS14	.39	74LS197	.59
74LS15	.26	74LS221	.59
74LS20	.17	74LS240	.69
74LS21	.22	74LS241	.69
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74LS27	.23	74LS243	.69
74LS28	.26	74LS244	.69
74LS30	.17	74LS245	.79
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74LS37	.26	74LS256	1.79
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4001	.19	14419	4.95
4011	.19	14433	14.95
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4017	.49	4522	.79
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4020	.59	4527	1.95
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4035	.69	4553	5.79
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4041	.75	4702	12.95
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4043	.85	74C14	.59
4044	.69	74C74	.59
4045	1.98	74C83	1.95
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4050	.29	74C151	2.25
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4060	.69	74C193	1.49
4066	.29	74C221	1.75
4069	.19	74C240	1.89
4076	.59	74C244	1.89
4077	.29	74C374	1.99
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4085	.79	74C911	8.95
4086	.89	74C917	8.95
4093	.49	74C922	4.49
4094	2.49	74C923	4.95
14411	9.95	74C926	7.95
14412	6.95	80C97	.95

7400/9000

7400	.19	74147	2.49
7402	.19	74148	1.20
7404	.19	74150	1.35
7406	.29	74151	.55
7407	.29	74153	.55
7408	.24	74154	1.49
7410	.19	74155	.75
7411	.25	74157	.55
7414	.49	74159	1.65
7416	.25	74161	.69
7417	.25	74163	.69
7420	.19	74164	.85
7423	.29	74165	.85
7430	.19	74166	1.00
7432	.29	74175	.89
7438	.29	74177	.75
7442	.49	74178	1.15
7445	.69	74181	2.25
7447	.89	74182	.75
7470	.35	74184	2.00
7473	.34	74191	1.15
7474	.33	74192	.79
7475	.45	74194	.85
7476	.35	74196	.79
7483	.50	74197	.75
7485	.59	74199	1.35
7486	.35	74221	1.35
7489	2.15	74246	1.35
7490	.39	74247	1.25
7492	.50	74248	1.85
7493	.35	74249	1.95
7495	.55	74251	.75
7497	2.75	74265	1.35
74100	2.29	74273	1.95
74121	.29	74278	3.11
74123	.49	74367	.65
74125	.45	74368	.65
74141	.65	9368	3.95
74143	5.95	9602	1.50
74144	2.95	9637	2.95
74145	.60	96S02	1.95

74S00

74S00	.29	74S163	1.29
74S02	.29	74S168	3.95
74S03	.29	74S174	.79
74S04	.29	74S175	.79
74S05	.29	74S188	1.95
74S08	.35	74S189	1.95
74S10	.29	74S195	1.49
74S15	.35	74S196	1.49
74S30	.29	74S197	1.49
74S32	.35	74S226	3.99
74S37	.69	74S240	1.49
74S38	.69	74S241	1.49
74S74	.49	74S244	1.49
74S85	.95	74S257	.79
74S86	.35	74S253	.79
74S112	.50	74S258	.95
74S124	2.75	74S280	1.95
74S138	.79	74S287	1.69
74S140	.55	74S288	1.69
74S151	.79	74S299	2.95
74S153	.79	74S373	1.69
74S157	.79	74S374	1.69
74S158	.95	74S471	4.95
74S161	1.29	74S571	2.95

VOLTAGE REGULATORS

TO-220 CASE

7805T	.49	7905T	.59
7808T	.49	7908T	.59
7812T	.49	7912T	.59
7815T	.49	7915T	.59

TO-3 CASE

7805K	1.39	7905K	1.49
7812K	1.39	7912K	1.49

TO-92 CASE

78L05	.49	79L05	.69
78L12	.49	79L12	.69

OTHER VOLTAGE REGS

LM323K	5V 3A	TO-3	4.79
LM338K	Adj 5A	TO-3	3.95
78H05K	5V 5A	TO-3	7.95
78H12K	12V5A	TO-3	8.95
78P05K	5V 10A	TO-3	14.95

LINEAR

TL066	.99	LM733	.98
TL071	.69	LM741	.29
TL072	1.09	LM747	.69
TL074	1.95	LM748	.59
TL081	.59	MC1330	1.69
TL082	.99	MC1350	1.19
TL084	1.49	MC1372	6.95
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LM309K	1.25	LM1458	.49
LM311	.59	LM1488	.49
LM311H	.89	LM1489	.49
LM317K	3.49	LM1496	.85
LM317T	.95	LM1812	8.25
LM318	1.49	LM1889	1.95
LM319	1.25	ULN2003	.79
LM320	see7900	XR2206	3.75
LM322	1.65	XR2211	2.95
LM323K	4.79	XR2240	1.95
LM324	.49	MPQ2907	1.95
LM331	3.95	LM2917	1.95
LM334	1.19	CA3046	.89
LM335	1.40	CA3081	.99
LM336	1.75	CA3082	.99
LM337K	3.95	CA3086	.80
LM338K	3.95	CA3089	1.95
LM339	.59	CA3130E	.99
LM340	see7800	CA3146	1.29
LM350T	4.60	CA3160	1.19
LF353	.59	MC3470	1.95
LF356	.99	MC3480	8.95
LF357	.99	MC3487	2.95
LM358	.59	LM3900	.49
LM380	.89	LM3909	.98
LM383	1.95	LM3911	2.25
LM386	.89	LM3914	2.39
LM393	.45	MC4024	3.49
LM394H	4.60	MC4044	3.99
TL494	4.20	RC4136	1.25
TL497	3.25	RC4558	.69
NE555	.29	LM13600	1.49
NE556	.49	75107	1.49
NE558	1.29	75110	1.95
NE564	1.95	75150	1.95
LM565	.95	75154	1.95
LM566	1.49	75188	1.25
LM567	.79	75189	1.25
NE570	2.95	75451	.39
NE590	2.50	75452	.39
NE592	.98	75453	.39
LM710	.75	75477	1.29
LM723	.49	75492	.79

H=TO-5 CAN, K=TO-3, T=TO-220

IC SOCKETS

	1-99	100
8 PIN ST	.13	.11
14 PIN ST	.15	.12
16 PIN ST	.17	.13
18 PIN ST	.20	.18
20 PIN ST	.29	.27
22 PIN ST	.30	.27
24 PIN ST	.30	.27
28 PIN ST	.40	.32
40 PIN ST	.49	.39
64 PIN ST	4.25	CALL
ST=SOLDERTAIL		
8 PIN WW	.59	.49
14 PIN WW	.69	.52
16 PIN WW	.69	.58
18 PIN WW	.99	.90
20 PIN WW	1.09	.98
22 PIN WW	1.39	1.28
24 PIN WW	1.49	1.35
28 PIN WW	1.69	1.49
40 PIN WW	1.99	1.80
WW=WIREWRAP		
16 PIN ZIF	4.95	CALL
24 PIN ZIF	5.95	CALL
28 PIN ZIF	6.95	CALL
40 PIN ZIF	9.95	CALL
ZIF=TEXTOOL		
(ZERO INSERTION FORCE)		

DATA ACQ

ADC0800	15.55	8T26	1.29
ADC0804	3.49	8T28	1.29
ADC0809	4.49	8T95	.89
ADC0816	14.95	8T96	.89
ADC0817	9.95	8T97	.59
ADC0831	8.95	8T98	.89
DAC0800	4.49	DM8131	2.95
DAC0806	1.95	DP8304	2.29
DAC0808	2.95	DS8833	2.25
DAC1020	8.25	DS8835	1.99
DAC1022	5.95	DS8836	.99
MC1408L8	2.95	DS8837	1.65

INTERFACE

INTERSIL

ICL7106	9.95
ICL7107	12.95
ICL7660	2.95
ICL8038	4.95
ICM7207A	5.95
ICM7208	15.95

EDGECARD CONNECTORS

100	PIN ST	S-100	.125	3.95
100	PIN WW	S-100	.125	4.95
62	PIN ST	IBM PC	.100	1.95
50	PIN ST	APPLE	.100	2.95
44	PIN ST	STD	.156	1.95
44	PIN WW	STD	.156	4.95

36 PIN CENTRONICS

MALE

IDCEN36	RIBBON CABLE	6.95
CEN36	SOLDER CUP	4.95
CEN36PC	RT ANGLE PC MOUNT	4.95

FEMALE

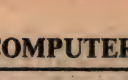
IDCEN36/F	RIBBON CABLE	7.95

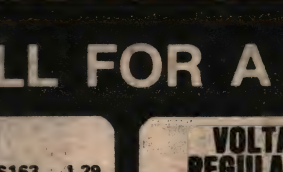
DIP CONNECTORS

DESCRIPTION	ORDER BY	CONTACTS								
		8	14	16	18	20	22	24	28	40
HIGH RELIABILITY TOOLED ST IC SOCKETS	AUGATxxST	.62	.79	.89	1.09	1.29	1.39	1.49	1.69	2.49
HIGH RELIABILITY TOOLED WW IC SOCKETS	AUGATxxWW	1.30	1.80	2.10	2.40	2.50	2.90	3.15	3.70	5.40
COMPONENT CARRIES (DIP HEADERS)	ICCxx	.49	.59	.69	.99	.99	.99	.99	1.09	1.49
RIBBON CABLE DIP PLUGS (IDC)	IDPxx	---	.95	.95	---	---	---	1.75	---	2.95

FOR ORDERING INSTRUCTIONS SEE D-SUBMINIATURE BELOW


ICC16


IDP14


AUGAT 24ST

D-SUBMINIATURE

DESCRIPTION		ORDER BY	CONTACTS					
			9	15	19	25	37	50
SOLDER CUP	MALE	DBxxP	.82	.90	1.25	1.25	1.80	3.48
	FEMALE	DBxxS	.95	1.15	1.50	1.50	2.35	4.32
RIGHT ANGLE PC SOLDER	MALE	DBxxPR	1.20	1.49	---	1.95	2.65	---
	FEMALE	DBxxSR	1.25	1.55	---	2.00	2.79	---
WIRE WRAP	MALE	DBxxPWW	1.69	2.56	---	3.89	5.60	---
	FEMALE	DBxxSWW	2.76	4.27	---	6.84	9.95	---
IDC RIBBON CABLE	MALE	IDBxxP	2.70	2.95	---	3.98	5.70	---
	FEMALE	IDBxxS	2.92	3.20	---	4.33	6.76	---
HOODS	METAL	MHOODxx	1.25	1.25	1.30	1.30	---	---
	GREY	HOODxx	.65	.65	---	.65	.75	.95

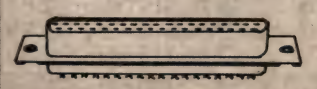
ORDERING INSTRUCTIONS: INSERT THE NUMBER OF CONTACTS IN THE POSITION MARKED "xx" OF THE "ORDER BY" PART NUMBER LISTED.

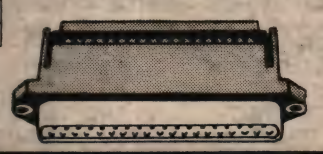
EXAMPLE: A 15 PIN RIGHT ANGLE MALE PC SOLDER WOULD BE DB15PR.

MOUNTING HARDWARE $1.00


MTG HDWR


HOOD25

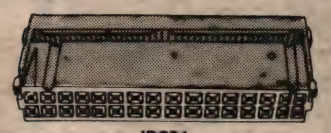

DB37S

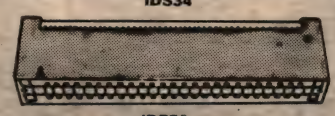

IDB37S

IDC CONNECTORS

DESCRIPTION	ORDER BY	CONTACTS					
		10	20	26	34	40	50
SOLDER HEADER	IDHxxS	.82	1.29	1.68	2.20	2.58	3.24
RIGHT ANGLE SOLDER HEADER	IDHxxSR	.85	1.35	1.76	2.31	2.72	3.39
WW HEADER	IDHxxW	1.86	2.98	3.84	4.50	5.28	6.63
RIGHT ANGLE WW HEADER	IDHxxWR	2.05	3.28	4.22	4.45	4.80	7.30
RIBBON HEADER SOCKET	IDSxx	.79	.99	1.39	1.59	1.99	2.25
RIBBON HEADER	IDMxx	---	5.50	6.25	7.00	7.50	8.50
RIBBON EDGE CARD	IDExx	1.75	2.25	2.65	2.75	3.80	3.95

FOR ORDERING INSTRUCTIONS SEE D-SUBMINIATURE ABOVE


IDS34


IDE50

DIODES/OPTO/TRANSISTORS

1N751	.25	4N26	.69
1N759	.25	4N27	.69
1N4148	25/1.00	4N28	.69
1N4004	10/1.00	4N33	.89
1N5402	.25	4N37	1.19
KBP04	.55	MCT-2	.59
KBU8A	.95	MCT-6	1.29
MDA990-2	.35	TIL-111	.99
N2222	.25	2N3906	.10
PN2222	.10	2N4401	.25
2N2905	.50	2N4402	.25
2N2907	.25	2N4403	.25
2N3055	.79	2N6045	1.75
2N3904	.10	TIP31	.49

LED DISPLAYS

FND-357(359)		COM CATHODE	.362"	1.25
FND-500(503)		COM CATHODE	.5"	1.49
FND-507(510)		COM ANODE	.5"	1.49
MAN-72		COM ANODE	.3"	.99
MAN-74		COM CATHODE	.3"	.99
MAN-8940		COM CATHODE	.8"	1.99
TIL-313		COM CATHODE	.3"	.45
HP5082-7760		COM CATHODE	.43"	1.29
TIL-311	4x7	HEX W/LOGIC	.270"	9.95
HP5082-7340	4x7	HEX W/LOGIC	.290"	7.95

DIFFUSED LEDS

		1-99	100-UP
JUMBO RED	T1¾	.10	.09
JUMBO GREEN	T1¾	.14	.12
JUMBO YELLOW	T1¾	.14	.12
MOUNTING HDW	T1¾	.10	.09
MINI RED	T1	.10	.09

SWITCHES

SPST	MINI-TOGGLE ON-ON	1.25
DPDT	MINI-TOGGLE ON-ON	1.50
DPDT	MINI-TOGGLE ON-OFF-ON	1.75
SPST	MINI-PUSHBUTTON N.O.	.39
SPST	MINI-PUSHBUTTON N.C.	.39
SPST	TOGGLE ON-OFF	.49
BCD OUTPUT 10 POSITION 6 PIN DIP		1.95

DIP SWITCHES

4 POSITION	.85	7 POSITION	.95
5 POSITION	.90	8 POSITION	.95
6 POSITION	.90	10 POSITION	1.29

RIBBON CABLE

CONTACTS	SINGLE COLOR		COLOR CODED	
	1'	10'	1'	10'
10	.18	1.60	.30	2.75
16	.28	2.50	.48	4.40
20	.36	3.20	.60	5.50
25	.45	4.00	.75	6.85
26	.46	4.10	.78	7.15
34	.61	5.40	1.07	9.35
40	.72	6.40	1.20	11.00
50	.89	7.50	1.50	13.25

HARD TO FIND "SNAPABLE" HEADERS

CAN BE SNAPPED APART TO MAKE ANY SIZE HEADER, ALL WITH .1" CENTERS

1x40	STRAIGHT LEAD	.99
1x40	RIGHT ANGLE	1.49
2x40	STRAIGHT LEAD	2.49
2x40	RIGHT ANGLE	2.99

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GOLD CONTACTS SPACED AT .1" CENTERS



5/$1.00

It was a pleasure to place an order with your people. I found the response pleasant and helpful and the answers prompt and correct. The delivery on my most recent order was fast, correct and well packed. I already had faith in the quality since my family has been using some of your products for several years with no problems.

Sincerely, J.D. Hattaway

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ONE TEAC FD-55B AND ROOM FOR A FULL OR ½ HEIGHT HARD DISK. A CLOSE-OUT SPECIAL FROM A MAJOR MANUFACTURER (WE CAN'T SAY WHO), PERFECT FOR THE HOBBYIST!

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IN ASSORTED COLORS $27.50
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500ea: 3.0", 3.5", 4.0"

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100 feet	$4.30	250 feet	$7.25
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Please specify color:
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* MANUFACTURED BY CORCOM
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* FITS LC-HP BELOW
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LC-3	2 CONDUCTOR	.99
LC-HP	3 CONDUCTOR W/STD FEMALE SOCKET	1.49

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3.15" SQ	ROTRON	14.95
3.63" SQ	ETRI	14.95
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WITH GOLD-PLATED EDGE-CARD FINGERS



IBM-PR2

IBM
BOTH CARDS HAVE SILK SCREENED LEGENDS AND INCLUDES MOUNTING BRACKET

IBM-PR1	WITH +5V AND GROUND PLANE	$27.95
IBM-PR2	AS ABOVE WITH DECODING LAYOUT	$29.95

S-100

P100-1	BARE - NO FOIL PADS	$15.15
P100-2	HORIZONTAL BUS	$21.80
P100-3	VERTICAL BUS	$21.80
P100-4	SINGLE FOIL PADS PER HOLE	$22.75

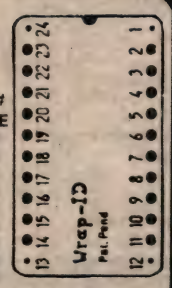
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P500-1	BARE - NO FOIL PADS	$15.15
P500-3	HORIZONTAL BUS	$22.75
P500-4	SINGLE FOIL PADS PER HOLE	$21.80
7060-45	FOR APPLE IIe AUX SLOT	$30.00

SOCKET-WRAP I.D.™
* SLIPS OVER WIRE WRAP PINS
* IDENTIFIES PIN NUMBERS ON WRAP SIDE OF BOARD
* CAN WRITE ON PLASTIC; SUCH AS IC #

PINS	PART#	PCK. OF	PRICE
8	IDWRAP 08	10	1.95
14	IDWRAP 14	10	1.95
16	IDWRAP 16	10	1.95
18	IDWRAP 18	5	1.95
20	IDWRAP 20	5	1.95
22	IDWRAP 22	5	1.95
24	IDWRAP 24	5	1.95
28	IDWRAP 28	5	1.95
40	IDWRAP 40	5	1.95

PLEASE ORDER BY NUMBER OF PACKAGES (PCK. OF)

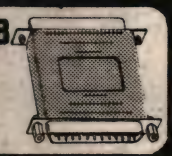


ID WRAP 24

FRAME STYLE TRANSFORMERS

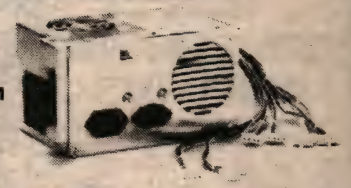
12.6V AC CT	2 AMP	5.95
12.6V AC CT	4 AMP	7.95
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25.2V AC CT	2 AMP	7.95

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* ONE YEAR WARRANTY



PS-IBM

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* SWITCH ON REAR
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* 90 DAY WARRANTY



PS-130

PS-A $49.95
* USE TO POWER APPLE TYPE SYSTEMS
* +5V @ 4A, +12V @ 2.5A -5V @ .5A, -12V @ .5A
* APPLE POWER CONNECTOR

PS-SPL200 $49.95
* +5V @ 25A, +12V @ 3.5A -5V @ 1A, -12V @ 1A
* UL APPROVED
* ALUMINUM ENCLOSURE



PS-A

PS-TDK $29.95
* +5V @ 4A, +12V @ 2A +12V @ 2.8A, -12V @ .30A
* 6.2" x 7.4" x 1.7", 1.6 LBS.

PS-11951 $29.95
* MANUFACTURED BY ASTEC
* +5V @ 6A, +12V @ 2A +12V @ 1.5A, -12V @ 2A,
* 5.0" x 8.0" x 2.0", 1.6 LBS.



PS-SPL200

CAPACITORS

TANTALUM

1.0µf	15V	.35	.47µf	35V	.45
6.8	15V	.70	1.0	35V	.45
10	15V	.80	2.2	35V	.65
22	15V	1.35	4.7	35V	.85
.22	35V	.40	10	35V	1.00

DISC

10pf	50V	.05	680	50V	.05
22	50V	.05	.001µf	50V	.05
27	50V	.05	.0022	50V	.05
33	50V	.05	.005	50V	.05
47	50V	.05	.01	50V	.07
68	50V	.05	.02	50V	.07
100	50V	.05	.05	50V	.07
220	50V	.05	.1	12V	.10
560	50V	.05	.1	50V	.12

MONOLITHIC

.01µf	50V	.14	.1µf	50V	.18
.047µf	50V	.15	.47µf	50V	.25

ELECTROLYTIC

RADIAL			AXIAL		
1µf	25V	.14	1µf	50V	.14
2.2	35V	.15	10	50V	.16
4.7	50V	.15	22	16V	.14
10	50V	.15	47	50V	.20
47	35V	.18	100	35V	.25
100	16V	.18	220	25V	.30
220	35V	.20	470	50V	.50
470	25V	.30	1000	16V	.60
2200	16V	.70	2200	16V	.70
4700	25V	1.45	4700	16V	1.25
COMPUTER GRADE			44,000µf	30V	3.95

DATARASE EPROM ERASER $34.95
* ERASES TWO EPROMS IN 10 MINUTES
* COMPACT-NO DRAWER
* THIN METAL SHUTTER PREVENTS UV LIGHT FROM ESCAPING



¼ WATT RESISTORS
5% CARBON FILM ALL STANDARD VALUES FROM 1 OHM TO 10 MEG. OHM

10 PCS	same value	.05	100 PCS	same value	.02
50 PCS	same value	.025	1000 PCS	same value	.015

RESISTOR NETWORKS

SIP	10 PIN	9 RESISTOR	.69
SIP	8 PIN	7 RESISTOR	.59
DIP	16 PIN	8 RESISTOR	1.09
DIP	16 PIN	15 RESISTOR	1.09
DIP	14 PIN	7 RESISTOR	.99
DIP	14 PIN	13 RESISTOR	.99

SPECIALS ON BYPASS CAPACITORS

.01 µf CERAMIC DISC	100/$5.00
.01 µf MONOLITHIC	100/$10.00
.1 µf CERAMIC DISC	100/$6.50
.1 µf MONOLITHIC	100/$12.50

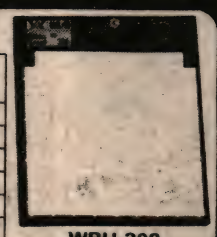
NEW BOOKS BY STEVE CIARCIA

BIULD YOUR OWN Z80 COMPUTER	$19.95
CIRCUIT CELLAR VOL 1	$17.95
CIRCUIT CELLAR VOL 2	$18.95
CIRCUIT CELLAR VOL 3	$18.95
CIRCUIT CELLAR VOL 4	$18.95

MICROCOMPUTER HARDWARE HANDBOOK
FROM ELCOMP $14.95
OVER 800 PAGES OF DATA SHEETS ON THE MOST COMMONLY USED ICs. INCLUDES TTL, CMOS, 74LS00, MEMORY, CPUs, MPU SUPPORT. AND MUCH MORE!

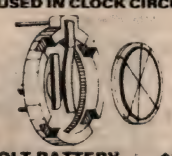
WISH SOLDERLESS BREADBOARDS

PART NUMBER	DIMENSIONS	DISTRIBUTION STRIP(S)	TIE POINTS	TERMINAL STRIP(S)	TIE POINTS	BINDING POSTS	PRICE
WBU-D	.38 x 6.50"	1	100	---	---	---	2.95
WBU-T	1.38 x 6.50"	---	---	1	630	---	6.95
WBU-204-3	3.94 x 8.45"	1	100	2	1260	2	17.95
WBU-204	5.13 x 8.45"	4	400	2	1260	3	24.95
WBU-206	6.88 x 9.06"	5	500	3	1890	4	29.95
WBU-208	8.25 x 9.45"	7	700	4	2520	4	39.95



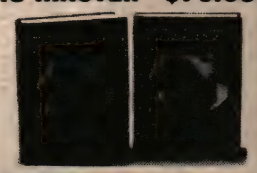
WBU-208

LITHIUM BATTERY
AS USED IN CLOCK CIRCUITS



3 VOLT BATTERY	$3.95
BATTERY HOLDER	$1.49

IC MASTER $79.95



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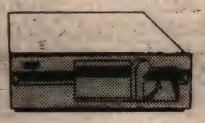
DISK DRIVES
FOR APPLE COMPUTERS

AP-150 $99.95



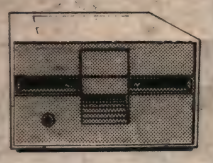
- ½ HT, DIRECT DRIVE
- 100% APPLE COMPATIBLE
- SIX MONTH WARRANTY

BAL-500 $129.95



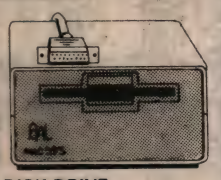
- TEAC MECHANISM-DIRECT DRIVE
- 100% APPLE COMPATIBLE
- FULL ONE YEAR WARRANTY

AP-135 $129.95



- FULL HT SHUGART MECHANISM
- DIRECT REPLACEMENT FOR APPLE DISK II
- SIX MONTH WARRANTY

MAC535 $249.95



- 3.5" ADD-ON DISK DRIVE
- 100% MACINTOSH COMPATABLE
- SINGLE SIDED 400K BYET STORAGE
- HIGH RELIABILITY DRIVE HAS AUTO-EJECT MECHANISM
- FULL ONE YEAR WARRANTY

AD-3C $139.95



- 100% APPLE IIc COMPATIBLE, READY TO PLUG IN, W/SHIELDED CABLE & MOLDED 19 PIN CONNECTOR
- FAST, RELIABLE SLIMLINE DIRECT DRIVE
- SIX MONTH WARRANTY

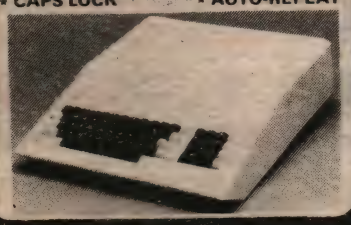
DISK DRIVE ACCESSORIES

FDD CONTROLLER CARD	$49.95
IIc ADAPTOR CABLE	$19.95

ADAPTS STANDARD APPLE DRIVES FOR USE WITH APPLE IIc

KB-1000 $79.95
CASE WITH KEYBOARD FOR APPLE TYPE MOTHERBOARD

- USER DEFINED FUNCTION KEYS
- NUMERIIC KEYPAD WITH CURSOR CONTROL
- CAPS LOCK
- AUTO-REPEAT



KEYBOARD-AP $49.95

- REPLACEMENT FOR APPLE II KEYBOARD
- CAPS LOCK KEY, AUTO-REPEAT
- ONE KEY ENTRY OF BASIC OR CP/M COMMANDS



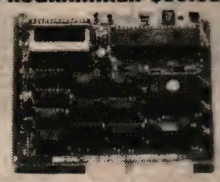
EXTENDER CARDS

IBM-PC	$45.00
IBM-AT	$68.00
APPLE II	$45.00
APPLE IIe	$45.00
MULTIBUS	$86.00

APPLE COMPATIBLE INTERFACE CARDS

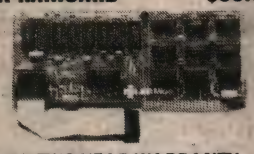
EPROM PROGRAMMER $59.95

MODEL RP525



- DUPLICATE OR BURN ANY STANDARD 27xx SERIES EPROM
- EASY TO USE MENU-DRIVEN SOFTWARE IS INCLUDED
- MENU SELECTION FOR 2716, 2732, 2732A, 2764 AND 27128
- HIGH SPEED WRITE ALGORITHM
- LED INDICATORS FOR ACTIVITY
- NO EXTERNAL POWER SUPPLY NEEDED
- ONE YEAR WARRANTY

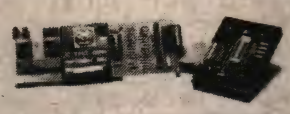
16K RAMCARD $39.95



- FULL TWO YEAR WARRANTY
- EXPAND YOUR 48K APPLE TO 64K
- USE IN PLACE OF APPLE LANGUAGE CARD

BARE PC CARD W/INSTRUCTIONS $9.95

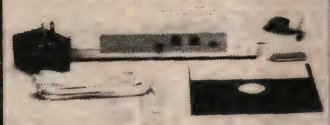
IC TEST CARD $99.95



- QUICKLY TESTS MANY COMMON ICs
- DISPLAYS PASS OR FAIL
- ONE YEAR WARRANTY
- TESTS: 4000 SERIES CMOS, 74HC SERIES CMOS, 7400, 74LS, 74L, 74H & 74S

300B MODEM $49.95
FOR APPLE OR IBM

INCLUDES ASCII PRO-EZ SOFTWARE



- FCC APPROVED
- BELL SYSTEMS 103 COMPATIBLE
- INCLUDES AC ADAPTOR
- AUTO-DIAL/AUTO-ANSWER
- DIRECT CONNECT

CABLE FOR APPLE IIc $14.95

JOYSTICK CR-401 $7.95

FOR ATARI 400, 800, 2600, VIC 20/64 AND APPLE IIe

DISKFILE

HOLDS 70 5¼" DISKETTES

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3.5" DISKFILE HOLDS 40 **$9.95**

POWER STRIP

- UL APPROVED
- 15A CIRCUIT BREAKER

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BAL 3-WAY SWITCH BOXES

- SERIAL OR PARALLEL
- CONNECTS 3 PRINTERS TO ONE COMPUTER OR VICE VERSA
- ALL LINES SWITCHES
- HIGH QUALITY ROTARY SWITCH MOUNTED ON PCB
- GOLD CONTACTS
- STURDY METAL ENCLOSURE



SWITCH-3P CENTRONICS PARALLEL **$99.95**

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BAL PRINTER BUFFERS

- FREES COMPUTER FOR OTHER TASKS WHILE PRINTING LONG DOCUMENTS
- STAND-ALONE DESIGN; WORKS WITH ANY COMPUTER OR PRINTER
- ALL MODELS FEATURE PRINT PAUSE MEMORY CHECK, GRAPHICS CAPABILITY

SP120P PARALLEL $139.95

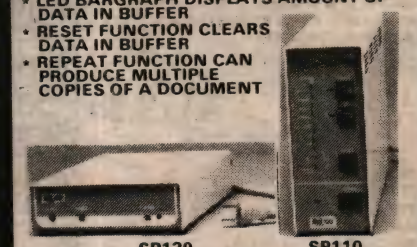
- 64K UPGRADABLE TO 256K
- LED INDICATOR SHOWS VOLUME OF DATA IN BUFFER

SP120S RS232 SERIAL $159.95

- 64K UPGRADABLE TO 256K
- 6 SELECTBALE BAUD RATES, FROM 600B—19,200B

SP110P PARALLEL $249.95

- 64K UPGRADABLE TO 512K
- SPOOLS OUTPUT OF UP TO 3 COMPUTERS
- LED BARGRAPH DISPLAYS AMOUNT OF DATA IN BUFFER
- RESET FUNCTION CLEARS DATA IN BUFFER
- REPEAT FUNCTION CAN PRODUCE MULTIPLE COPIES OF A DOCUMENT



SP120 SP110

NASHUA DISKETTES DEALS
5¼" SOFT SECTOR
DS/DD WITH HUB RINGS

$9.90 BOX OF 10 **69¢ea** BULK QTY 50 **59¢ea** BULK QTY 250

NASHUA DISKETTES WERE JUDGED TO HAVE THE HIGHEST POLISH AND RECORDED AMPLITUDE OF ANY DISKETTES TESTED ACCORDING TO "COMPARING FLOPPY DISKS", BYTE 9/84

DISKETTES

NASHUA 5¼"

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N-MD2F	DS/QUAD SOFT	$34.95
N-MD2H	DS/HD FOR AT	$49.95

NASHUA 8"

N-FD1	SS/DD SOFT	$27.95
N-FD2D	DS/DD SOFT	$34.95

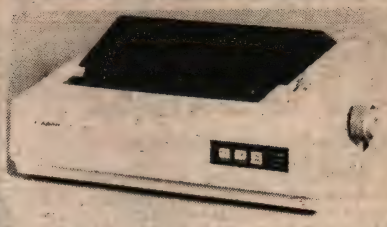
NASHUA 3.5"

N-3.5SS	3.5" SS/DD FOR MAC	$32.95

VERBATIM 5¼"

V-MD1D	SS/DD SOFT	$23.95
V-MD2D	DS/DD SOFT	$29.95
V-MD110D	SS/DD 10 SECTOR HARD	$23.95

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Printed in draft mode
or Proportional and NLQ

- EPSON/IBM COMPATIBLE CONTROL CODES
- 11 x 9 DOT DRAFT MODE CHARACTERS
- 18 DOTS IN "NEAR LETTER QUALITY"
- 2K PRINT BUFFER
- DOWNLOADING FONT BUFFER
- FAN FOLD, CUT SHEET OR ROLL PAPER
- SOLID "BUSINESS" MACHINE

MODEL PW 1080A

$199.95

CABLE TO IBM PC $9.95

5¼" FLOPPY DISK DRIVES

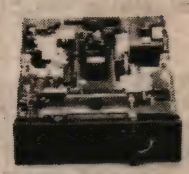
TEAC FD-55B ½ HT DS/DD (FOR IBM)	$89.95
TEAC FD-55F ½ HT DS/QUAD (FOR IBM)	$99.95
TEAC FD-55GFV ½ HT DS/HD (FOR IBM AT)	$154.95
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MPI-B52 DS/DD (FOR IBM)	$89.95
QUME QT-142 ½ HT DS/DD (FOR IBM)	$69.95

8" FLOPPY DISK DRIVES

FD 100-8 SS/DD (SA/801 EQUIV)	$119.00
FD 200-8 DS/DD (SA/851R EQUIV)	$159.00

DISK DRIVE ACCESSORIES

TEAC SPECIFICATION MANUAL	$5.00
TEAC MAINTENANCE MANUAL	$25.00
½ HT MOUNTING HARDWARE	$2.95
MOUNTING RAILS FOR IBM AT	$4.95
"Y" POWER CABLE FOR 5¼" FDDs	$2.95
5¼" FDD POWER CONNECTORS	$1.19



TEAC FD-55



TANDON TM100-2

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APPLE TYPE CABINET W/OUT POWER SUPPLY

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FULL HT 5¼" BEIGE CABINET W/POWER SUPPLY

CAB-2SV5 $49.95
DUAL SLIMLINE 5¼" CABINET W/POWER SUPPLY

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DUAL SLIMLINE 8" CABINET W/POWER SUPPLY

CAB-2FH8 HORIZINTAL $219.95
DUAL FULL HT 8" CABINET W/POWER SUPPLY



CAB-2SV5



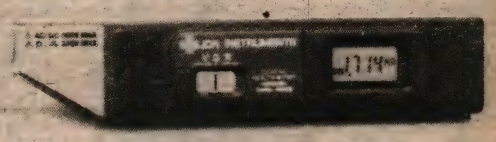
CAB-1FH5

TEST EQUIPMENT FROM JDR INSTRUMENTS

DIGITAL MULTIMETER PEN DPM-1000 $54.95

AUTO RANGING, POLARITY AND DECIMAL!

- LARGE 3.5 DIGIT DISPLAY
- DATA HOLD SWITCH FREEZES READING
- FAST, AUDIBLE CONTINUITY TEST
- LOW BATTERY INDICATOR
- OVERLOAD PROTECTION



20MHz DUAL TRACE OSCILLOSCOPE MODEL 2000 $389.00

35MHz DUAL TRACE OSCILLOSCOPE MODEL 3500 $549.00

FOR MORE INFORMATION ON THE OSCILLOSCOPES, SEE OUR NEW CATALOG.

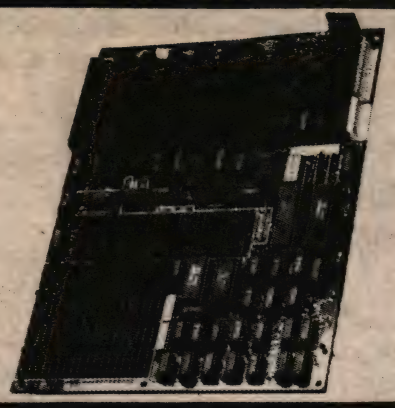
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BUILD A COMPLETE XT SYSTEM—$698

XT COMPATIBLE MOTHERBOARD

$169.00



- 4.77 MHz 8088 CPU, OPTIONAL 8087 CO-PROCESSOR
- 8 EXPANSION SLOTS
- 0K RAM INSTALLED, EXPANDABLE TO 640K ON-BOARD MEMORY
- ALL ICs SOCKETED-HIGHEST QUALITY PC BOARD
- ACCEPTS 2764 OR 27128 ROMS

PRO-BIOS $29.95

HARD DISK SYSTEMS

Includes short slot HD Controller, cables, mounting hardware and instructions. All drives are pre-tested and come with a one year warranty.

10 Mb $389

20 Mb $489

IBM COMPATIBLE INTERFACE CARDS

ALL WITH A ONE YEAR WARRANTY

MULTI I/O FLOPPY CARD $129.95

PERFECT FOR THE 640K MOTHERBOARD



- 2 DRIVE FLOPPY DISK CONTROLLER
- 1 RS232 SERIAL PORT; OPTIONAL 2nd SERIAL PORT
- PARALLEL PRINTER PORT
- GAME PORT
- CLOCK/CALENDAR
- SOFTWARE: CLOCK UTILITIES, RAMDISK, SPOOLER

MULTIFUNCTION CARD $119.95

ALL THE FEATURES OF AST'S 6 PACK PLUS AT HALF THE PRICE



- CLOCK/CALENDAR
- 0-384K RAM
- SERIAL PORT
- PARALLEL PORT
- GAME PORT
- SOFTWARE INCLUDED

PRINTER CABLE $9.95

64K RAM UPGRADE 9/$8.91

COLOR GRAPHICS ADAPTOR $99.95

FULLY COMPATIBLE WITH IBM COLOR CARD



- 4 VIDEO INTERFACES: RGB, COMPOSITE COLOR, HI-RES COMPOSITE MONOCHROME, CONNECTOR FOR RF MODULATOR
- COLOR GRAPHICS MODE: 320 x 200
- MONO GRAPHICS MODE: 640 x 200
- LIGHT PEN INTERFACE

MONOCHROME GRAPHICS CARD $119.95

FULLY COMPATIBLE WITH IBM MONOCHROME ADAPTOR & HERCULES GRAPHICS



- LOTUS COMPATIBLE
- TEXT MODE: 80 x 25
- GRAPHICS MODE: 720 x 348
- PARALLEL PRINTER INTERFACE
- OPTIONAL SERIAL PORT $19.95

MONOCHROME ADAPTOR $49.95

ANOTHER FANTASTIC VALUE FROM JDR!

- IBM COMPATIBLE TTL OUTPUT
- 720 x 350 PIXEL DIPLAY

PLEASE NOTE: THIS CARD WILL NOT RUN LOTUS GRAPHICS AND DOES NOT INCLUDE A PARALLEL PORT

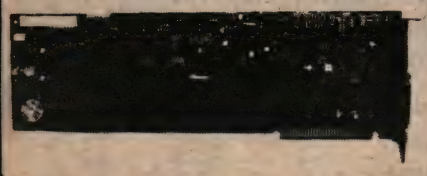
FLOPPY DISK DRIVE ADAPTOR $49.95



- INTERFACES UP TO FOUR STANDARD FDDs TO IBM PC OR COMPATIBLES
- INCLUDES CABLE FOR TWO INTERNAL DRIVES
- STANDARD DB37 FOR EXTERNAL DRIVES
- RUNS QUAD DENSITY DRIVES WHEN USED WITH JFORMAT

EASYDATA 1200 BAUD MODEM FOR IBM

INCLUDES PC TALK III COMMUNICATIONS SOFTWARE



- HAYES COMPATIBLE
- AUTO DIAL/AUTO ANSWER
- AUTO RE-DIAL ON BUSY
- INCLUDES SERIAL PORT!
- ONE YEAR WARRANTY

$169.95

CRT MONITORS FOR ALL APPLICATIONS



TAXAN RGB VISION III

MODEL 415

- MADE FOR TAXAN BY ACORN
- 640 x 262 PIXEL RESOLUTION
- 16 COLORS
- 18 MHz BANDWIDTH
- 12" BLACK MATRIX
- IBM AND LOTUS COMPATIBLE

CABLE FOR IBM $15.95

$289.95

SAKATA COMPOSITE COLOR

MODEL SC-100

- TOP RATED FOR APPLE
- 13" COMPOSITE VIDEO
- RESOLUTION: 280H x 300V
- INTERNAL AUDIO AMPLIFIER
- ONE YEAR WARRANTY

$169.95

SAMWOO/ALPHA MONOCHROME

MODEL DM-216B

- PERFECT COSMETIC MATCH FOR IBM PC
- IBM COMPATIBLE TTL INPUT
- 12" NON-GLARE SCREEN
- P39 GREEN PHOSPHOR
- HI-RES 22 MHz BAND WIDTH

$99.95

BUILD YOUR OWN XT COMPATIBLE SYSTEM!

XT MOTHERBOARD	$169.00
PRO-BIOS	$29.95
64K RAM	$8.91
130 WATT POWER SUPPLY	$89.95
FLIP-TOP CASE	$49.95
DKM-2000 KEYBOARD	$79.95
½ HEIGHT DISK DRIVE	$69.95
FLOPPY DISK CONTROLLER	$49.95
MONOCHROME ADAPTOR	$49.95
MONOCHROME MONITOR	$99.95
TOTAL:	$697.51

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IBM PRINTER CABLE



- DB25 TO CENTRONICS
- SHIELDED CABLE

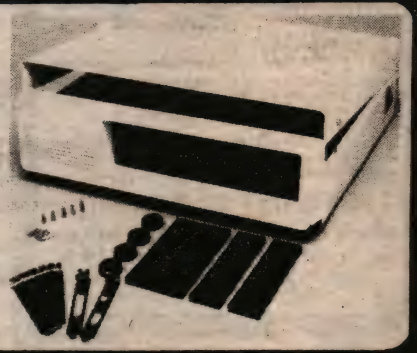
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AN ATTRACTIVE STEEL CASE WITH A HINGED LID FITS THE POPULAR PC/XT COMPATIBLE MOTHERBOARDS

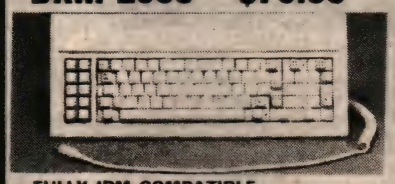
- SWITCH CUT-OUT ON SIDE FOR PC/XT STYLE POWER SUPPLY
- CUT-OUT FOR 8 EXPANSION SLOTS
- ALL HARDWARE INCLUDED

$49.95



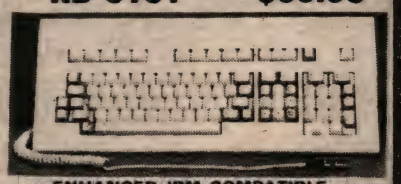
IBM COMPATIBLE KEYBOARDS

DKM-2000 $79.95



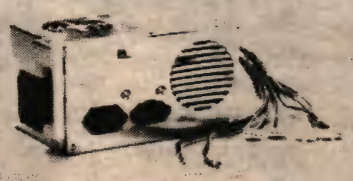
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MacUniverse
continued from page 58

ly designed. Winning depends solely on stamina. For example, no matter how well played, Hacker cannot be solved unless the player begins purchasing the document in one country. Unless you are a dedicated game player, there are many better games to buy. Hacker is widely available and has a suggested price of $44.95. Hacker is copy protected.

A much better game is Enchanted Scepters by Silicon Beach Software. This is a fun adventure game that utilizes outstanding graphics and sounds. In the game the player is given the role of Saber, apprentice to the great wizard, Elron. Your country, Callion, is threatened by a great army of evil Hurks. Elron can repel the invations with a mighty spell only if he has four enchanted scepters. Unfortunately, the scepters were lost years ago. Saber's mission is to travel to four kingdoms to recover them.

Enchanted Scepters is a large graphics adventure. There are over 200 scenes populated by over 30 characters. There are over 30 digitized sounds, things, like breaking glass, monster roars, flute

continued on page 147

New Macintosh
continued from page 136

compatible systems can print to the LaserWriter. IBM PCs and PC compatibles can access the LaserWriter via Tangent Technologies' IBM/AppleTalk card, which allows IBM PCs and PC compatibles to connect onto an AppleTalk network. The LaserWriter also includes a Diablo 630 emulation feature that lets IBM PC owners use Apple's printer. Several popular MS-DOS productivity software packages, such as Microsoft Word and Chart, include PostScript printer drivers, so IBM users of these applications also can print to Apple's LaserWriter. Apple expects other software programs in the future to include PostScript printer drivers, making it possible for many more personal computer users to take advantage of the LaserWriter printer's advanced publishing capabilities.

The new LaserWriter Plus adds even greater printing versatility and power to the Macintosh computer/LaserWriter printer system. It includes all of the advanced features of the LaserWriter, but in addition, its ROM has been expanded to a full megabyte to store an additional seven font families. These new font families - Palatino, New Century Schoolbook, Helvetica Narrow, ITC Bookman, ITC Avant Garde, ITC Zapf Chancery, and ITC Dingbats - are built into the LaserWriter Plus in addition to the original four in the LaserWriter - Times, Helvetica, Courier and Symbol. The seven new fonts were selected

continued on page 144

These are the typefaces available in the LaserWriter:

Times
Times Italic
Times Bold
Times Bold Italic

Helvetica
Helvetica Oblique
Helvetica Bold
Helvetica Bold Oblique

Courier
Courier Italic
Courier Bold
Courier Bold Italic

Symbol α ματηεματιχαλφονταβχδεφγηιφκλμνοπ

These are the additional typefaces available in the LaserWriter Plus:

ITC Avant Garde Gothic Book
ITC Avant Garde Gothic Book Oblique
ITC Avant Garde Gothic Book Demi
ITC Avant Garde Gothic Demi Oblique

ITC Bookman Light
ITC Bookman Light Italic
ITC Bookman Demi
ITC Bookman Demi Italic

Helvetica Narrow
Helvetica Narrow Oblique
Helvetica Narrow Bold
Helvetica Narrow Bold Oblique

New Century Schoolbook
New Century Schoolbook Italic
New Century Schoolbook Bold
New Century Schoolbook Bold Italic

Palatino
Palatino Italic
Palatino Bold
Palatino Bold Italic

ITC Zapf Chancery Medium Italic

ITC Zapf Dingbats ✇✈➞✓✓✕✖✗✗✚✐✪▲✻✻✻✻✻✻●✢

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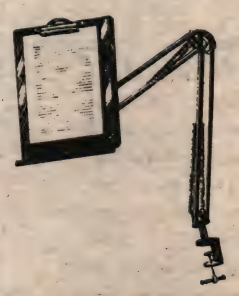
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PRINTER PAPER	HALF-PAK	FULL CARTON
9½ x 3⅔ 20# BLANK WHITE ONE THIRD SHEETS	4,500—22.00	9,000—38.00
9½ x 5½ 20# BLANK WHITE HALF-SHEETS	3,000—22.00	6,000—38.00
9½ x 11 20# 1/6" BLUE BAR E-Z READ	1,500—22.00	3,000—36.00
9½ x 11 20# BLANK WHITE	1,500—22.00	3,000—35.00
9½ x 11 20# BLANK WHITE*	1,250—21.95	2,500—29.95
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9½ x 11 20# WHITE 25% RAG*	1,000—36.00	2,000—69.95
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6 x 3 INDEX CARDS	2,000—16.00	4,000—28.00
5 x 3 NET SIZE AVAILABLE GOLD OR WHITE		
7 x 4 INDEX/POST CARDS	2,000—20.00	4,000—38.00
6 x 4 NET SIZE AVAILABLE GOLD OR WHITE		
5 x 2⅛ ROLODEX CARDS	1,000—17.00	2,000—29.00
4 x 2⅛ NET CARD SIZE WHITE ONLY		
6 x 3 ROLODEX CARDS	1,000—18.00	2,000—31.00
5 x 3 NET CARD SIZE WHITE ONLY		

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3½ x 15/16	1 ACROSS	2,500— 6.50	5,000—12.50
	2 ACROSS	5,000—13.00	10,000—25.00
	3 ACROSS	7,500—19.00	15,000—37.50
4 x 1⅞6	1 ACROSS	2,500—13.00	5,000—24.00
	2 ACROSS	5,000—26.00	10,000—48.00
4 x 7/16	1 ACROSS FILE FOLDER	2,500—11.00	5,000—19.00



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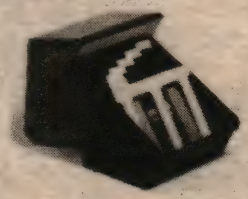
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New Macintosh continued from page 143

for their popularity and usefulness for all types of printing jobs. All 11 fonts are available in a variety of styles, providing laserWriter Plus users with 35 different typefaces to choose from in customizing their documents. These 35 typefaces are available in virtually limitless point sizes and orientations, depending on the software application being used.

The LaserWriter Plus also includes:

- a new printer installation disk that allows Macintosh 512K, Macintosh Plus and Macintosh XL users to print with any member of the LaserWriter or ImageWriter printer product families;
- a new Font/Desk Accessory (F/DA) Mover disk that lets LaserWriter and Laser/Writer Plus users load onto a disk only those typefaces they need, thereby conserving disk space for other data;
- support of additional downloadable fonts available from third party companies, such as Adobe Systems, Inc., giving users even more flexibility in tailoring their documents; and
- a revised LaserWriter manual that describes the printer's new fonts and software.

LaserWriter Upgrade Path

Existing LaserWriter owners can upgrade their printers to a LaserWriter Plus through a dealer-installable upgrade kit. This upgrade path allows LaserWriter users to expand their system as their printing needs grow. The upgrade kit will be available from all Apple LaserWriter dealers worldwide this March, and will sell in the U.S. for a suggested retail price of $799.

For those LaserWriter users whose publishing needs grow to require a commercial typesetting machine, Linotype Corporation offers two phototypesetters, the Linotronic 100P and Linotronic 300P, that use the PostScript language, are fully Macintosh-compatible and 100 percent plug-compatible with both LaserWriter models. These commercial typesetting machines ensure that customers who select Apple's Macintosh and LaserWriter products to meet their publishing needs have a complete, upward growth path.

Price and Availability

The LaserWriter and LaserWriter Plus work with Macintosh 512K, Macintosh XL or Macintosh Plus computer systems, as well as other manufacturers' computers. The LaserWriter Plus will be available worldwide this March, and will sell in the U.S. for a suggested retail price of $6,798. The LaserWriter is available now worldwide and sells in the U.S. for a suggested retail price of $5,999. ●

LASERWRITER™ PLUS SPECIFICATIONS

MARKING ENGINE:	Canon LBP-CX laser-xerographic engine
PROCESSOR:	Motorola 68000 processor (12 MHz clock speed)
MEMORY:	1 megabyte ROM (read only memory) 1 1/2 megabytes RAM (random access memory)
INTERFACE:	AppleTalk™ and RS-232C
PRINT QUALITY:	All text and graphics printed at 300 by 300 dots per inch
BUILT-IN FONTS:	Helvetica, Times, Courier, Symbol, Palatino, ITC Avant Garde, ITC Bookman, Helvetic Narrow, New Century Schoolbook, ITC Zapf Chancery, ITC Dingbats
SPEED:	8 pages per minute maximum throughput
PRINTING PROTOCOLS:	PostScript™, and a subset of the Diablo® 630 command set
PRINT MATERIALS:	Letter, legal, A4, B5 sizes 16-20 lb. single-sheet photocopy bond 8-34 lb. letterhead and colored stock Transparency overhead film Envelopes and labels supported via manual feed

PRINTABLE SURFACE:	Letter	Legal	A4	B5
Width (inches):	8.0	7.0	7.5	7.0
Length (inches):	10.9	12.5	10.5	10.0

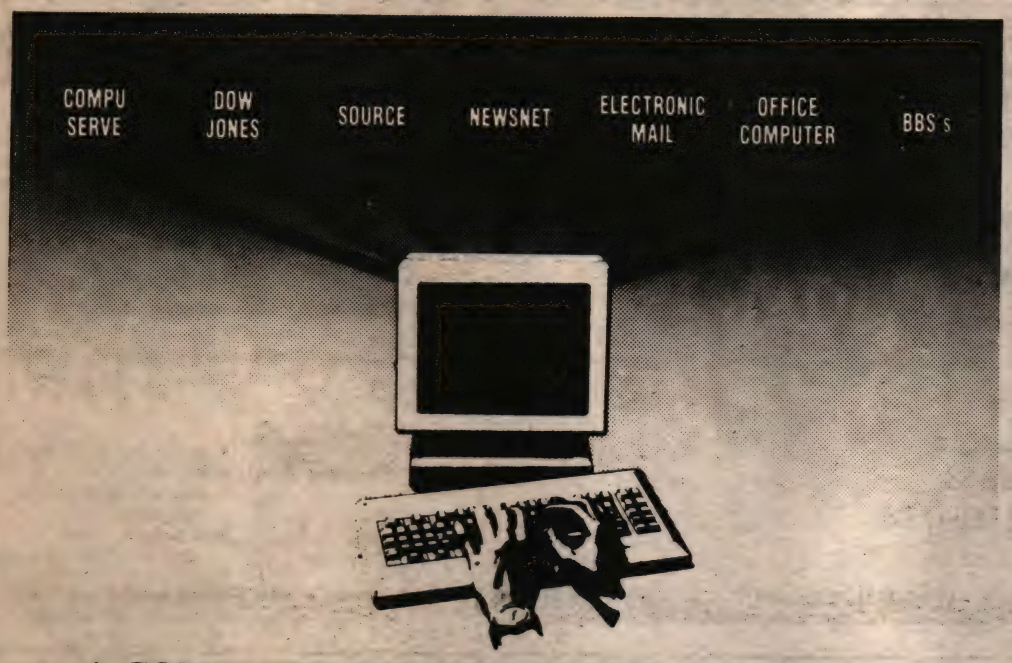
SIZE AND WEIGHT:	Weight	Height	Width	Depth
	77 lbs.	11.5 inches	18.5 inches	16.2 inches

(Depth is 28.2 inches with trays attached)

US Model: 115 VAC (± 10 percent) 60 Hz

Macintosh Specifications continued on page 150

INTELLICOM



A COMPLETE COMMUNICATIONS PROGRAM

Now you can tap any of the countless telephone data based INFO sources. EXTRACT and FILE that data away for use later. Suddenly, your computer is the smartest terminal around because INTELLICOM emulates such terminals as:

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- **CompuServe Executive**
- **Simple TTY**
- **TeleVideo 925**

Now you can transfer **both binary and text** files, using simple ASCII, ASCII Capture, Xon/Xoff, XMODEM (both Cheksum and CRC are supported) or CompuServe A Protocols. Operate at any speed up to 4800 (Sanyo 555 or IBM PC Jr .versions) or 9600 baud (IBM PC) without ever being outdated as higher speed/lower priced modems are introduced

Simple menu selections, with a built in **HELP** facility keep it easy forever. And our expert mode will allow you to even bypass the menus. **Autodial directories (Hayes or equivalent modems) are supported along with simultaneous printing.** Our **built in DOS WINDOW** will actually **let you run another program** from within INTELICOM **(192K min. ram).**

Additional features: Variable Buffer Size reduces disk activity, while utilizing RAM capacity. **BATch file utility program** included. **Persistence feature for autodialing. Remote operation is supported.**

Auto log-on script files can be used to support almost any smart modem and/or automatically log into your favorite remote system. **User defined function keys. Color support. Michtron and AOK DOS support (Sanyo)** and more! Best of all, the entire versatile INTELLICOM package costs you ONLY **$89.95 COMPLETE! Rush $15 today and you'll receive a fully functional demo disk that lets you check it all out.** If you order INTELICOM, simply return the demo disk and we'll deduct your $15 from the $89.95 purchase price.

For $10.00 more we will supply you with the host support code for the error checking protocol on Dec system 10, 20, or VAX ... and save your company a bundle!

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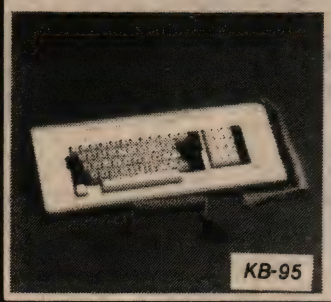
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DETACHED KEYBOARD $95.00



- Apple-Franklin compatible
- Programmer keyboard
- Enhance over 40% of keyboard functions
- Microprocessor control with Upper/Lower case
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- 3 user-programmable keys
- Standard numeric key pad
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- Curly-cord connector and connector mate included

S & H $5.00

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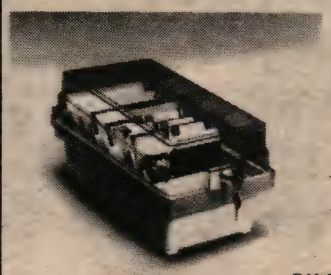
SS/DD G-Neric diskettes w/hub rings, sleeves & write protect tab (pkg. of 20) **$20**

FREE DISK DOUBLER with purchase of 100 pcs Diskettes

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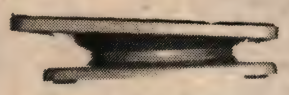
FLIP 'N' SORT $12.95



- Elegant appearance
- Key lock for file integrity
- Smoke top w/beige base
- Protect up to 100 5¼" diskettes
- Ten movable dividers
- Non-slip guides keep disks upright and flat

S & H $4.50

ADJUSTABLE MONITOR STAND $12.95



- Tilts and swivels display
- Rotates 360°
- Tilt-angle adjustable and lockable
- Rubber pads on top and bottom guarantee no slipping
- Holds all size monitors

S & H $4.50

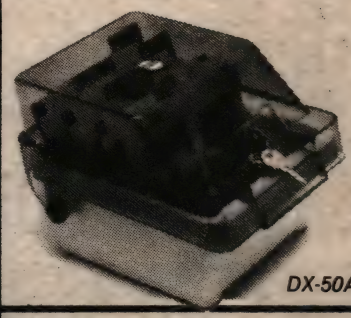
JOY STICKS $17.95



- Apple II + , IIe, IIc, or IBM pc compatible
- Self-centering w/metal handle
- Adjustable verticle and horizontal
- Hand-held model with AutoFire
- Please specify II + , IIe , IIc or IBM pc on order

S & H $4.00

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- Built-in carrying handle
- Elegant appearance
- Key lock for file integrity
- Smoke top w/white base
- Protect up to 50 5¼" diskettes
- Four movable dividers
- Non-slip guides keep disks upright and flat
- 6½"H, 8¾"L, 7"W

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APPLE COMPATIBLE

16K RAM CARD - II & II/ + upgrade to 64K **$35**
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Disk Controller Card - II/ + & II/E for dual drives . **$35**
Printer Card with Cable - Centronics Parallel; II/ + & II/E **$35**

S & H $4.00

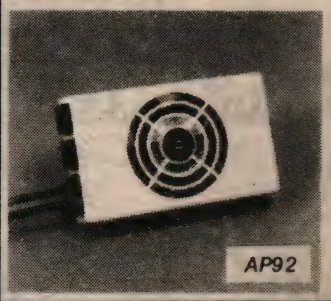
DISK DOUBLER $6.95



- Accurate position guide
- Hand-held compact design
- Square notch-cut
- Sturdy, all-metal construction

S & H $4.00

COOLING FAN $29.95



- New super-thin design
- Adjustable: fits all cases
- Dual outlets for monitor and printer
- Heavy duty switch w/power on pilot light
- Built-in power surge protection
- Also fits Commodore model 1541 drive

S & H $4.00

RF MODULATOR SET S & H $4.00 $9.95



- RF Modulator
- TV Interface
- Coaxial Cable

KEYBOARD DRAWER S & H $10.00 $69.95



- Slides out on ball-bearing glides and locks.
- Steel platform with baked-on beige enamel finish to match your PC
- Space-saving size: 3⅜"h x 22"w x 15½"d

EXTERNAL PORT

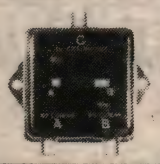
ONE PORT **$4.95**
FOUR PORT **$12.95**



- Apple II + I/O extender
- Easy access to I/O
- One-port or four-port available
- Control by individual switch

S & H $4.00

VIDEO 'FLIPPER' $9.95



- Easily flips from 40 to 80 column mode and back
- One computer to two monitors connection and select
- Two computers to one monitor connection and select

S & H $4.50

ANTI-GLARE PANEL $29.95



- Fit 12" to 14" Video Display Terminals
- Reduce Glare from VDTs on color and monochrome screens
- Enhance the contrast between image and background.
- Easy mounting

S & H $4.00

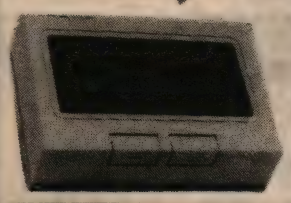
FLOPPY DISK DRIVE $145

HALF-HEIGHT S & H $6.00



- Apple compatible 5¼"
- 250 KB disk capacity (unformatted)
- High-speed (6 ms) access time
- 149 x 45 x 230 mm
- Made in Japan

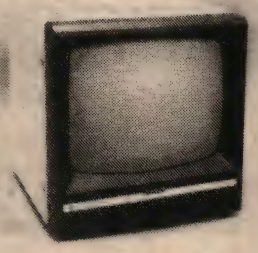
A B SWITCH $69.95



- Two position push button Centronics-style switch
- Parallel transmission
- Beige color to match your PC
- Perfect for connecting two printers to one computer or connect two computers to one printer with parallel interface
- Size: 1⅞"h x 7⅛"w x 5"d

S&H $5.00

MONITORS $100



AMBER :

- Amber HI-RES monitor
- 12" display
- Non-glare screen finish
- 20 MHz
- 1000 lines @ center

$225

COLOR :

- Color/Green selectable
- 14" display
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- Audio/video output
- Volume control

S & H $13.00

APPLE™ COMPATIBLE $199.00



INCLUDES (as shown):

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MacUniverse
continued from page 143

playings, doors slamming and the like. The commands of Enchanted Scepters are simple; either one or two word commands. For example typing north or Command-N will move you north and an object is picked up by clicking it.

Enchanted Scepters is not a "brain buster" like some other games. You do have to wander about a lot, get clues, and collect objects in order to solve many of the game's puzzles, but there are no arbitrary, off-the-wall commands. The only negative thing that can be said about Enchanted Scepters is that serious gamesters may find it too easy. Enchanted Scepters is copy protected and costs $39.95.

Hard Disk 20 Problem List

I bet it is fun to work as an engineer for Apple. The people they hired to design the HD20 were probably instructed to design a hard disk that was incompatible with as much commercially available software as possible. While I say this as a joke, Apple blew the compatibility problem with the HD 20. What follows is a partial list of progams that will not work with it.

Red Ryder 6.2: The program will work but you cannot send or receive files.

MusicWorks: Will load music, but makes unintelligible sound.

Fokker Triplane: A system error occurs when the throttle is activated.

Macintosh Pascal: It crashes after launch. However, Pascal programs can be stored on the Hard drive.

Sargon III: Program crashes after launch.

Hayden Speller: Program crashes after launch.

Dollars and Sense: Program crashes after launch.

MockWrite desk accessory: Creates a file, but that file is not recognized by any application, including MockWrite.

Concertware[+]: All Player files and Instrument files must be in the same folder or the program won't find them and will display "not found" instrument icons.

Smartcom II: Works Okay except that the application, all documents and any files that are sent or received must be in the root.

Microsoft Chart, Multiplan, and Word: These programs use a protected, invisible file as their security. Unfortunately Finder 5.0 does not like protected, invisible files. Put these files on a floppy created under Finder 4.1 and the programs should work.

Jazz Comment: *The Software Digest Rating Newsletter* recently did an evaluation of integrated software. While primarily concerned with IBM PC software it decided to add Jazz, by Lotus Corporation, to its recent torture test of integrated software. Besides Jazz, it tested Ability, Electric Desk, Enable, Framework, Smart Software System, Symphony, and IBM's Topview and the Assistant Series.

In testing the programs, Software Digest (1) gave a group of business people a set of typical tasks to fulfill using all features of the program, (2) had its own technical experts run 68 different tests measuring program speed, capacity, and quality, and (3) verified every advertised feature of the programs.

The upshot of all this test was that Jazz came out with a

continued on page 148

QuickStick
continued from page 58

is playing arcade games. There is definitely something to be said for being able to pick the QuickStick up and lean back in a chair.

Should You Buy the QuickStick?

Unless you are a dedicated video game player, I cannot recommend that anyone rush out and buy this unit as it does not offer a clear cut advantage over the mouse. However if the mouse needs to be replaced, consider the QuickStick. At $74.95 it is a competitively priced replacement peripheral.

QuickStick - Model #820030
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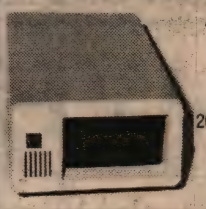


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MacUniverse continued from page 147

very respectable rating. It was ranked second only to the Smart Software System (which cost $300 more). Jazz beat all of the IBM programs for ease of use and its graphic ability. Its weakest area was communications.

The reason I mention this is that a recent trend has started to appear. Corporate America is taking a second look at the Macintosh. The reason for this is the cost of training a user. It is so much cheaper to train someone to use the Macintosh than an IBM that the cost differential is attracting notice from the corporate powers that be. Let's hope this trend continues.

An Excellent Book

Terry Ward has written a book called *Programming C On The Macintosh*. Published by Scott, Foresman and Company, this book belongs on the desk of every student of C. The text is broken into three areas. Part one presents a background information on the Macintosh concept of software design, an overview of the C language in general, and the various C compilers available for the Macintosh. Part two systematically examines the major components of Macintosh software; e.g. QuickDraw, memory management, Window Routines, Menu controls, and the Text Edit. The book concludes with a section of applications programs. Eight programs of increasingly complexity are presented in order to highlight the programming points made by the book.

2400 Baud Caveat

Are you thinking of buying a 2400 baud modem in order to more quickly download files from Compuserve or the Source? If so, think again. I recently read a proposal written by John Powers called *Minimizing File Upload/Download Cost*. According to Mr. Power's calculations, a 2400 baud modem may not be the cheapest way to download a file. It appears there is the "overhead" factor. "Overhead" is the momentary pause between blocks of data. This block does not decrease in proportion to the modem communication speed. Each block of data must be acknowledged by the receiving computer before the sending computer will transmit the next block. The time it takes to do this is determined by (1) the time it takes the receiving computer to write the block to disk, (2) how long the sending computer takes to read the next block from disk, (3) how busy the network is, (4) and how heavily loaded the sending or receiving computers are.

According to Mr. Power's calculations with a 1-second "overhead," the cost to download is about 0.9 cents per block at 300 bps, 0.7 cents at 1200 bps., and 0.8 cents at 2400 bps. Typical "overhead" times on Compuserve range from 0.8 to 1.3 seconds. If overhead can be shortened to less than 0.5 seconds, then it even begins to pay to download at 2400 bps.

Among tips suggested by Mr. Powers to lessen "overhead" are (1) what steps can be taken to shorten the overhead? There are a few things you can do before you log on to Compuserve. First saving a downloaded file to a RAM disk. This saves time because it is faster to read from a RAM disk than a physical disk. Likewise files to be uploaded should be copied to a RAM disk before connecting to Compuserve since reading from RAM disk is also faster. Second, if you have a hard disk, transfer the file to it, because hard disk I/O is much faster than floppy disk I/O. Finally, connection to Compuserve or the Source during off periods should cut down on file transfer times simply because the host computers and the networks are less loaded.

Compuserve Files of the Month

Instead of mentioning files available on Compuserve, I must give you a warning. It appears some perverted souls have now created worm programs for the Macintosh. These are programs that will crash your disk and destroy any files on it.

Protecting yourself from worm programs is easy. Under no circumstances, run an unknown program on a hard disk or floppy disk that contains important data. Instead run it on a blank system disk and see what happens. Second, make backups. I know this sounds corny, but you would be surprised at the number of people who have been burned by forgetting to do this (yours truly is included).

If you get burned by such a program, please tell the person who gave it to you. If you downloaded it from a bulletin board, contact the Sysop so he or she can remove it.

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continued on page 151

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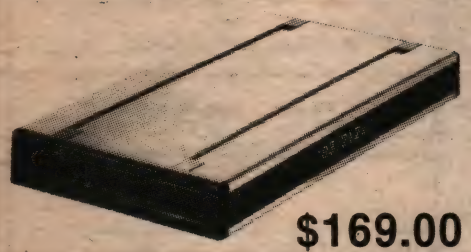
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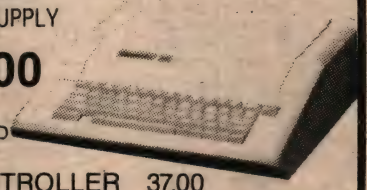
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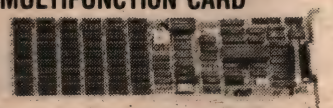


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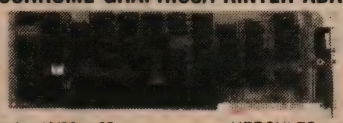


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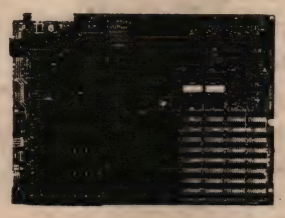
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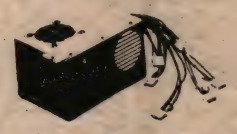
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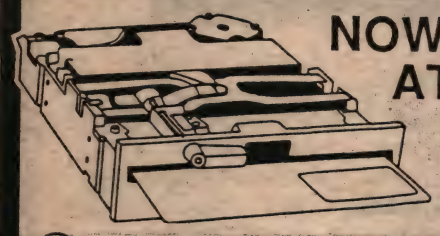
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Macintosh Specifications continued from page 144

MACINTOSH™ 800K EXTERNAL DRIVE SPECIFICATIONS

DISK CAPACITY:
800K per formatted double-sided disk
1246K per unformatted double-sided disk

RECORDING MEDIA:
3 1/2-inch hard-shell media
2 recording surfaces
80 tracks per inch

INTERFACE:
Connects directly to the Macintosh or Macintosh Plus external disk port

CHARACTERISTICS:
Seek Time: 6 milliseconds maximum (track to track)
Settle Time: 30 milliseconds maximum
Drive Startup Time: 600 milliseconds maximum

POWER REQUIREMENTS:
+12 volts
Standby:
10 microamps
Typical: 120 milliamps
Peak: 600 milliamps
(during eject, 2-second maximum duration)
+5 volts
Standby:
10 milliamps
Typical: 200 milliamps

HEAD POSITION:
+/-0.035 millimeters

SIZE AND WEIGHT:

Weight	Height	Width	Depth
1.29 kg	48.5 mm	120 mm	200 mm
2.84 lbs.	1.91 inches	4.72 inches	7.87 inches

ENVIRONMENT:
Operating
Ambient Temperature: 40-122 degrees Farenheit, 5-50 degrees Centigrade
Relative Humidity: 5-90%
Non-operating 5-90%
Ambient Temperature: -40-140 degrees Farenheit, -40-60 degrees Centigrade

MACINTOSH™ PLUS SPECIFICATIONS

PROCESSOR:
MC68000, 32-bit internal architecture
7.8336 MHz clock frequency

MEMORY:
1 megabyte RAM
128K ROM
Includes 256 bytes of user-settable parameter memory

DISK CAPACITY:
800K per formatted double-sided disk
3 1/2-inch, hard-shell media

SCREEN:
9-inch, diagonal monochrome display
512 by 342 pixels, bit-mapped

INTERFACES:
Synchronous serial keyboard bus
Two RS232/RS422 serial ports (230.4K baud maximum)
Mouse interface
External disk interface
SCSI interface (320K bytes per second maximum)

SOUND GENERATOR:
4-voice sound with 8-bit digital-analog conversion using 22 KHz sample rate

INPUT:
Line voltage: 105 to 125 volts AC, RMS
Frequency: 50 or 60 Hz Power: 60 watts

KEYBOARD:
78 key, 2-key rollover, software mapped, detachable, with built-in numeric keypad and direction keys

MOUSE:
Mechanical tracking, optical shaft encoding 3.54 pulse per mm (90 pulse per inch) of travel

CLOCK/CALENDAR:
CMOS custom chip with 4.5 volt (Eveready No. 523 or equivalent) user-replaceable battery backup

SIZE AND WEIGHT:

	Weight	Height	Width	Depth
Main Unit	7.5 kg 16 lb., 8 oz.	344 mm 13.5 inches	246 mm 9.7 inches	276 mm 10.9 inches
Keyboard	1.2 kg 2 lb., 10 oz.	65 mm 2.6 inches	395.4 mm 15.6 inches	146 mm 5.8 inches
Mouse	.2 kg 7 oz.	37 mm 1.5 inches	60 mm 2.4 inches	109 mm 4.3 inches

ENVIRONMENT:
Operating Temperature: 10-40 degrees Centigrade, 50-104 degrees Farenheit
Storing Temperature: -40-50 degrees Centigrade, -40-122 degrees Farenheit
Humidity, all conditions: 5% to 90% relative humidity
Altitude: 0 to 4615 m (0 to 15,000 feet)

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MacViz Video Imaging System

Microvision Company of Stoneham, Massachusetts offers the MacViz Video Imaging System. The MacViz is designed to fill the need of Macintosh users that are in the desk top publishing industry or any professional who requires the ability to meld high resolution graphics with various test processing programs.

Microvision is providing the Macintosh user complete solutions. MacViz offers real time video digitizing speed with continous gray levels in a spray paint effect, MacPaint File compatibility, the largest image of any video digitizer (512 x 512 pixels) and on screen dynamic focusing, "what you see is what you get." All this is accomplished in a unique hardware circuit that allows 1/30 of a second real time frame grabbing. Microvision Company also offers necessary video peripherals, such as B + W cameras, zoom macro-lenses and copy stands. All other equipment is available at reasonable prices. Microvision Company offers solutions to all imaging problems.

Microvision Company has improved the overall performance of the MacViz over the former product, MacPrivate Eye. Overall image sharpness and resolution has been increased by up to 30%. Color filtering and video stabilization circuit have been added, to allow real time viewing of VCR tapes directly on the Macintosh screen and usage of any type of video camera, color or black and white.

Currently, MacViz Video Imaging System is being sold via mail order. The price is $299.00 plus $7.50 for shipping and handling. (UPS Regular Ground) The Camera offered is a Panasonic WV-140 for $229.00 Microvision also offers a zoom macro 12.5mm to 75mm lens for $219.00 (Video C mount) and a Copystand with variable intensity lights for $159.00.

Microvision Company is offering solutions to the new and expanding Desk Top Publishing Industry and associated industries.

For additional information contact Microvision Company, 38 Montvale Avenue, Stoneham, MA 02180; (617) 438-5520.

Mention that you read about it in *Computer Shopper*. ●

Reviews of Newpoker continued from page 70

Terry Drive, Toldeo, OH 43613. Phone: (419) 472-3360.

Solitaire: MichTron's Card-Playing Baby (or Baby-Sitter)

Cards, Version 1.2, is the alternate name for the package written by Factory Programming and distributed by MichTron as Solitaire. Although higher in price than Newpoker, MichTron's offering here actually contains five programs which you select from a simple menu: 1 for Blackjack, 2 for Cribbage, 3 for Klondike, 4 for Poker Squares, 5 for Solitaire. Pressing Esc. produces a return to DOS. Just to start with a game I knew (ha!), I picked Blackjack. The menu program selection causes the Blackjack program to be loaded, and as with Newpoker, the colors are stunning. The opening display explains the basic rules, and there is little or no need for a manual, as evidenced by my not using one for this review. After shuffling, the cards are dealt. I can hit 1, hit; 2, stand; or 3, double on my total of nine. I hit and get a ten. Now my choices are just numbers 1 and 2 (hit, stand), so of course I stand.

And so on. I notice that I can bet only up to 99 dollars; the program will ignore any attempt to go higher by noting the first two digits and using them before you can even reach for the return key. Sounds like a nice feature to have if you really are going to play for money!

I did not see any graceful way to exit, so I hit the break key. As with Newpoker, you cannot list the program or save the program from Basic, although it can be copied at the DOS level. Evidently, you are expected to lose in order to get back to the menu. In my excitement to try the other games, I became too impatient and broke out in order to reload the menu program. Now I tried Solitaire. The rules sounded about the way I had learned them (I won't rehash them here), so I proceeded.

Somehow, I did not understand the intent of the cards without the manual. This is not necessarily a criticism, but I was starting to get spoiled by all these games which were

continued on page 169

The Silver Box continued from page 134

ing me to get on it so far. I will try to start it shortly.

Q And A

EXTERNAL DRIVE: One of the frequently asked question is how to install the external drive. I believe I answered the question in the last column but when I wrote it I was more or less preoccupied with my Silver Box which has the 5V 8A power. For most of the readers an external power supply is required. Sanyo MBC-550/555 can accommodate up to four drives as it is with no software patches.

COMPUTER ANGLE: One reader from Atlanta wanted to know if it is a good idea to put Sanyo vertically. I think it is a great idea because of several reasons. One, you can place the power supply on the top of your computer if you put the left side down, thus avoiding the hot air from the power supply reaching the disk drives and PC boards. Two, you can get better convection of air. Fresh air can come in from the now bottom area which used to be the left side of the computer. Three, the hot air exhaust will not heat up the entire computer. Four, you can keep your drives cool.

COMPUTER BLOW: A reader from New Jersey reported that when he implemented the resistor change in the power supply as suggested by a Sanyo technician, the pass transistor shorted out and most of the ICs were wiped out. He reported that the cost of a new CPU board was $800.00. He was able to revive the color board by replacing bad memory chips but not the main board.

My advice in repairing those damaged PC boards is to apply the 5V power to the board. Pick out the particularly hot ones and remove them for testing. Test the clock generator first with a scope. The clock is the most important signal in a computer. If you don't have a scope an analog multi-meter may help. Check the voltage on pin 9 of U99 IC. The voltage should be somewhere between 1.5V to 3.0V. If OK check the pin 10 of the same IC. If the voltage is within the same range the clock is, most probably, working.

Next, stop the clock by shorting the pin 10 of the IC U99 to ground. Measure all the leads of all the ICs. Do not short anything. A spark can mean further damage. They should be either more than 2.8V or less than 0.5V. Any in between voltages (except when the clock is working) mean the pin is either connected to the output of a bad IC or the pin belongs to the output of the bad IC, but except for open inputs.

(I had scheduled to inform our readers this month how to build a crowbar module to protect your computer when the inevitable transient forces its way into your power supply and shorts out the power transistor. But I have to postpone it until next month). ●

MacUniverse continued from page 148

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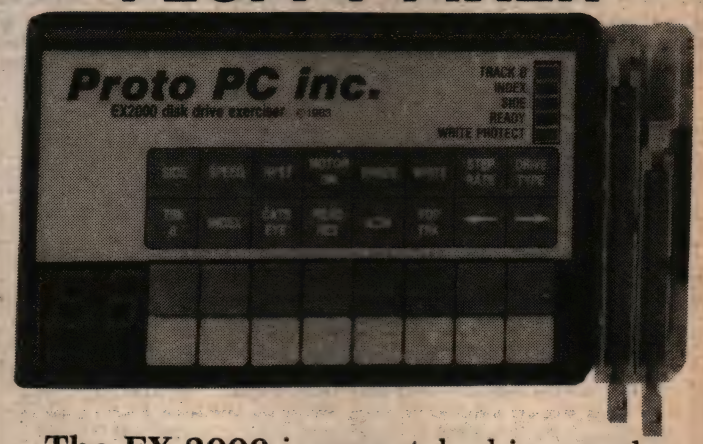
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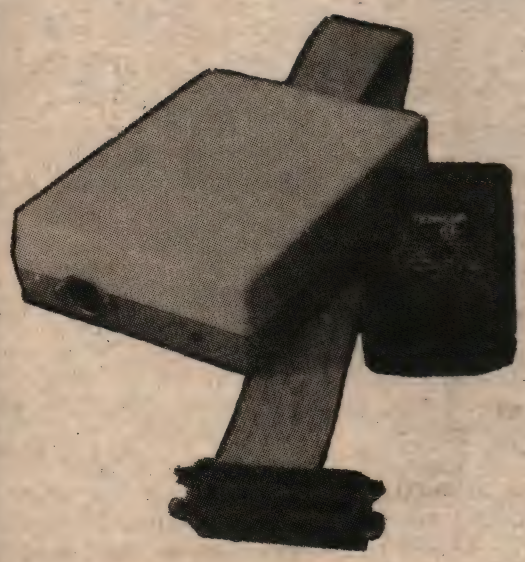
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Ask The Guru continued from page 135

phase with each other.

Jim has made a brilliant breakthrough in solar pump engineering. By dynamically changing the pump stroke in proportion to the available sunlight, his small controller completely eliminates the need for any storage batteries, inverters, or other costly, hard to maintain, and inefficient add-ons.

Jay is a wildlife biologist and ornithologist living in a primitive area. He is very interested in remote data acquisition and recording of environmental and weather data. He is also involved in spectral analysis of bird calls.

Gary is into model railroading in a big sort of way. Instead of just detecting when a train goes by a certain point, a bar code scanner reads a label pasted underneath each car. Not only do you detect the presence of a train, but you can also tell which train it is, along with the speed, direction, and exact arrangement of all of its cars.

Bill is developing an ultra-cheap video frame grabber that lets the *Apple* do most of the work. A small control computer is invaluable in working out the initial timing details, without needing costly custom hardware changes.

As I said, these are all real people doing real things that the VIP can and will greatly help. All these people welcome inquiries and consulting work. They also accept cash in small bills. Just write or call if you want me to put you in touch with any of them.

Are USGS Maps Available As Computer Readable Data Bases?

Yes. Much of the contents of most USGS topographic maps is now available as computer readable tapes under the *U.S. Geodata* program from the *National Cartographic Information Center*.

The format is your choice of big dino computer tape or else in cuneiform on fired clay tablets, packed with a 0.03 cubit spacing of papyrus reeds.

The price is not cheap, but it is not bad either if you really need the data. Charges around $100 per tape are typical.

Typical data bases include survey boundaries, state and county lines, place names, and water features. The actual topographic contours are not yet available, since a vastly bigger data base would be required.

In fact, someday, you'll flip a CD videodisk into your *Apple XVIII*, hit a few keys, and instantly print yourself high quality full color laser copy of any map of any part of the country to any detail level you like. Maps are a nearly ideal subject for videodisk storage.

What Is Curve Tracing?

Some black magic involving *curve tracing* is one of the secrets that lets *Applewriter* on an *Apple IIe* produce unmatchably superb graphic images for the *Laserwriter*.

As we've seen before, these images are vastly better than those that are available from *any* screen oriented graphics program on *any* other personal computer.

Curve tracing easily draws straight lines, square corners, sharp vees, and complex, smooth flowing curves. It does so with an astonishingly low number of input data points. As examples, a large circle needs only four data points, and a full page gray-shaded cartoon character ends up with a file length shorter than a typical business memo.

Let's go step by step through a curve trace and see just how it works.

You start out by picking some data points, as we have done in figure one. The points will obey two crucial rules:

(1) Each point must be on the curve you want to draw.

(2) The slope or *tangent* of the curve at any point will be parallel to a line drawn between the previous point and the next point coming up.

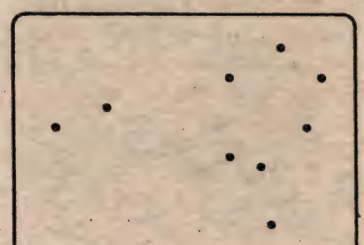


Figure One - To draw a smooth curve, first pick a few data points . . .

continued on page 154

Macintosh AppleTalk File Server Software

General Computer Corp. has announced HyperNet, a new file server software program that lets users of as many as thirty-two Macintosh computers linked through an AppleTalk network share hard-disk storage capacity, files, and programs. The announcement was made at the MacWorld Exposition in San Francisco.

"Until now about all you could do with an AppleTalk network was use it to share a laser printer. HyperNet opens up a whole range of new multiuser applications for the Macintosh, especially in such areas as electronic publishing, accounting, and data base management." said Kevin Curran, president of General Computer.

Each copy of HyperNet will include a "host" program to be installed on a Macintosh equipped with one of General Computer's HyperDrive internal hard disk drives. Network users can make unlimited copies of an accompanying "client" program for other Macintosh computers on the network.

HyperNet displays the contents of remote hard disks on the network as a series of standard Macintosh desktop icons. Users can work directly with remote files and programs, or they can move copies to their own machines (except for copy protected programs). When several users are updating the same remote file, HyperNet has a file locking procedure that allows only one person at a time to write new data to the file. Others may only read the file's contents without being able to make modifications. In addition, users of HyperNet do not have to designate a specific Macintosh and hard disk as a dedicated network file server.

HyperNet gives everyone on the network access to a common pool of hard disk storage. As a result, users can work with files that are kept on several different machines, and disk storage can be allocated dynamically among network participants. Users needing more storage capacity need not replace the file server, they just add another HyperDrive.

"HyperNet takes advantage of the utility programs that are already built into our HyperDrive hard disk products so that HyperNet users already have password protection and encryption options for files they don't want to share. And all HyperDrives come with a backup utility and a print spooler that can be activated remotely through the network," said Curran.

A HyperNet network can include Macintosh computers without hard disks as well as a mix of standard 512K Macintosh and Macintosh Plus models. HyperNet supports the Corvus OmniNet semaphore protocol, so that multiuser data base programs will run without modification on HyperNet.

HyperNet, scheduled for shipment in May, will be priced at $295. General Computer plans to distribute HyperNet through approximately 1,200 authorized General Computer dealers in the United States as well as through its international distributors.

For further information, contact General Computer Corp., 215 First Street, Cambridge, Mass. 02142, (617) 492-5500.

Mention that you read about it in the *Computer Shopper*. ●

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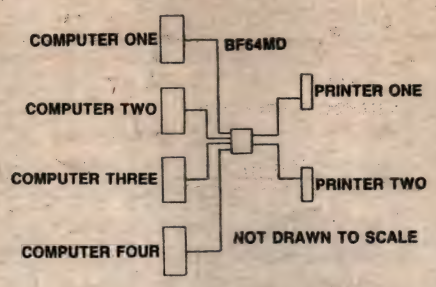
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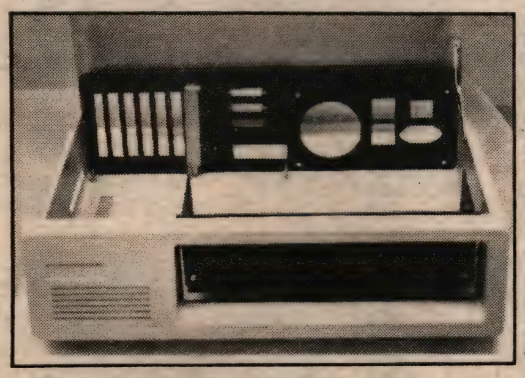
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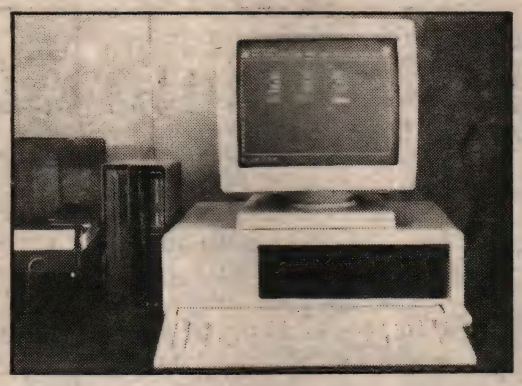
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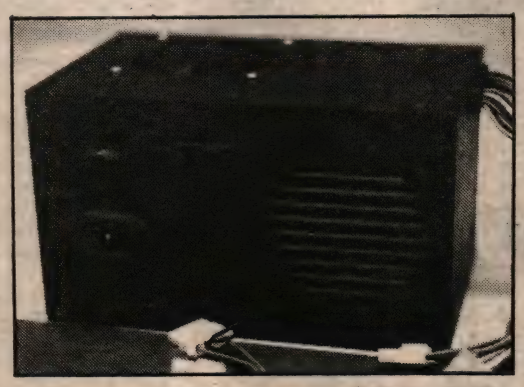
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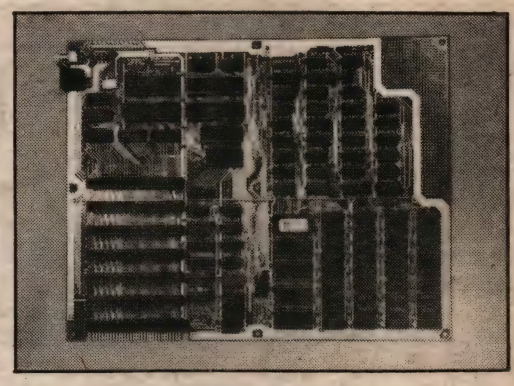


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Ask The Guru
continued from page 152

The location and the spacing of the points is up to you. Obviously, the more points you use, the closer the curve fit, and the better the results. The fewer points you use, the shorter the file, and the faster the image will get drawn.

Not so obvious is your choice of spacing between adjacent points. But if you follow the two rules, and remember that the slope at any point is set by the adjacent point pair, things will work out pretty good.

Next, you punch these data points into *Applewriter,* bracket them, and follow them with the magic word *curvetrace,* and out comes figure two, an extremely smooth curve. You should have previously installed my curvetrace routine into your text file.

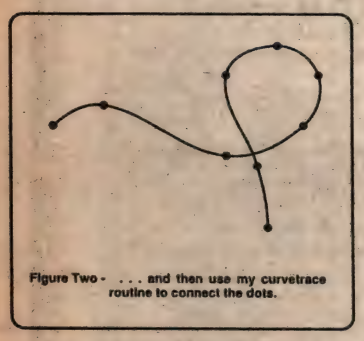


Figure Two - . . . and then use my curvetrace routine to connect the dots.

Both ends of the curve need special treatment. At the start, you tell the curve the direction you want to head in, expressed in degrees. At the end of the curve, you tell the curve the direction you want to come from, also expressed in degrees.

My routine takes the points and then converts them into data values needed by the cubic spline feature of the *Laserwriter.* Once converted to cubic splines, the rest is trivial. You can think of my curvetrace routine as an "inverse spline transformer."

Hint: should some area look a tad ratty, pay close attention to the *difference* between adjacent data points, making sure these are changing in a smooth way.

I'll be most happy to send you a free listing of my curvetrace routine if you call or write. I'll also throw in some cartoon samples and some other goodies. Don't forget that I also have a free *Laserwriter* demo pack available for you.

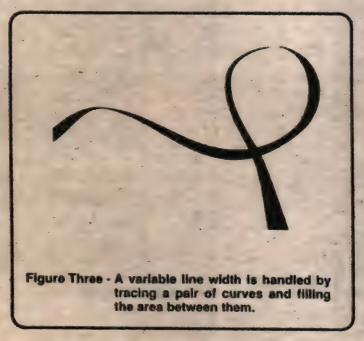


Figure Three - A variable line width is handled by tracing a pair of curves and filling the area between them.

Back to the program.

Figure three shows us how you handle a variable width curve. What you do is trace two adjacent curves and then fill in the distance between them.

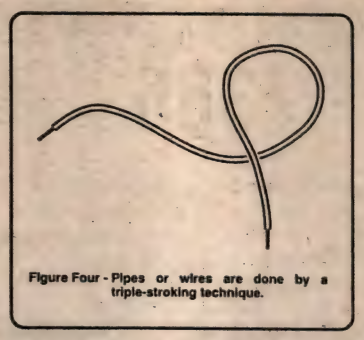


Figure Four - Pipes or wires are done by a triple-stroking technique.

Figure four shows how you would draw a wire, a pipe, braiding, or an alaborate border. You start out with a curvetrace. Then you use this path over again three times in a row. The first time, you draw a wide white line. This line will erase anything the wire or pipe "runs over," giving the neat little break you see at the crossover.

Next, you draw a slightly narrower black line. This sets the "outside diameter" of the pipe or the wire. Finally, you draw an even narrower white line. This produces the "inside" of the pipe or wire.

The apparent black line width you end up with is one half of the difference between the width of the black stroke and the white one.

Comprehende?

Now that may look like a plain old wire to you. But for years I have been searching for a way to quickly and believably show natural looking wires for electronic pictorials and such. Thanks to good old *Applewriter,* wires are now a trivial task.

Let us move on. Figure five shows us how to handle a cusp or a sharp edge. All you do is double the data point, using the same point pair twice in a row. Figure six shows us a Roman "I" that combines a mix of straight lines, cusps, and smooth curves.

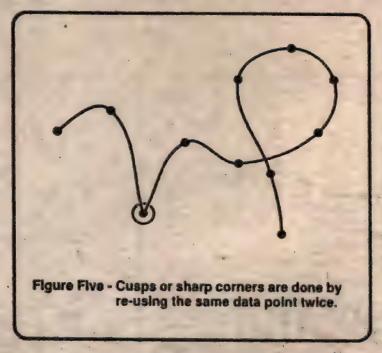


Figure Five - Cusps or sharp corners are done by re-using the same data point twice.

While this figure was done with one long curvetrace to prove it could be done, you are usually better off curve tracing only those parts of the figure that really need it, and using ordinary line drawing for everything else. This will be faster, more compact, and gives you better control of the ends of any curved areas.

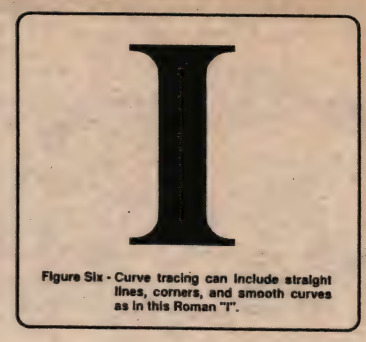


Figure Six - Curve tracing can include straight lines, corners, and smooth curves as in this Roman "I".

Now for the artsy-craftsy stuff. There is a parameter in my curvetrace routine called the *tension.* Normally, you hold the tension to its optimum value, which is often + 2.82.

The tension determines the "enthusiasm" with which the curve leaves or enters the next point. With optimum tension, you get the most accurate possible curvetrace.

But being accurate is no fun. At least not all the time.

Instead, some very neat things happen when you vary the tension away from its optimum value. If you use a tension of 1000 or greater, you will get straight lines between all the points. These straight lines are a useful debugging tool that make sure the points

continued on page 155

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Ask The Guru continued from page 154

are really where you want them.

A tension of zero does the exact opposite, and shows you the tangent line through each point. This is also useful as a debugging tool.

Tension values positive and above normal tend to flatten the curve. Tension values positive and below normal tend to loop or "destabilize" the curve. Positive tension values near zero (say 0.3) give you "spirograph" effects, while negative tension values near zero (try –0.3) give you "inverse spirograph" effects with all the loops on the inside, rather than the outside of the curve.

Finally, our just for fun figure seven shows you the effects of varying tension of a simple curvetrace. What utterly and totally boggles the mind is that this *entire* figure is derived from only *seven* data points!

Lancaster, Ask the Guru, Column Fourteen, Figure Seven

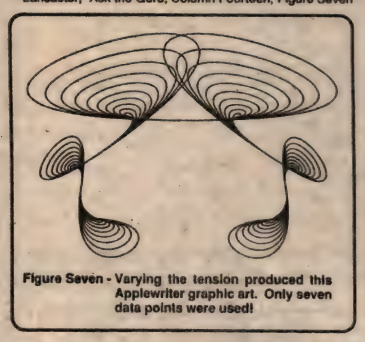


Figure Seven - Varying the tension produced this Applewriter graphic art. Only seven data points were used!

So, What Good Is Curve Tracing?

There are all sorts of incredibly powerful things you can do with curve tracing.

The biggie, of course, is downloadable type fonts. By curvetracing, you can have very smooth letters and characters that even get better as they are magnified, and yet need only one compact file to handle any and all different sizes and orientations of text on the page.

Next on the list are signatures. There are two ways to handle laser printed hand signatures. You can create a bitmap of a signature with a digitizer, or else you can use a curvetrace. The curvetrace will almost always end up far smoother and far more convincing, besides taking up far less file space and not needing any expensive equipment, skills, or special setup.

Cartoon characters are obvious possibilities. As I mentioned above, I have a few I would like to share with you if you call or write. Free form art of any kind is another obvious candidate. One obvious example would be a large indian head for a silk screened Tee-shirt.

We've already seen how pipes and wires can be handled for tech illustrations. The same ideas can be abstracted for borders, braiding and such.

One thing that radically excites me about curve tracing is that you can eliminate the need for any digitizer, scanner or video camera when grabbing artwork! The curvetrace points are sparse enough that you can quickly and easily digitize most anything by hand.

Here's how I currently digitize stuff. First, I enlarge the original art on a copier, making the image as big as possible. I then run off several copies. These copies are then put into the *Laserwriter* paper tray, and one of the grids from my *Applewriter/Laserwriter Utilities* package is overprinted onto them.

In the case of a character in a font, a special grid is used instead that is carefully scaled and rotated until the character is squarely sitting inside a 1000 x 1000 box.

Continuing, you then put the combined grid and art image on a piece of cork and stab

continued on page 168

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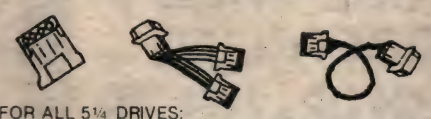
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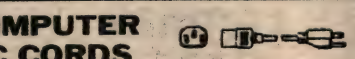
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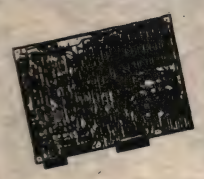
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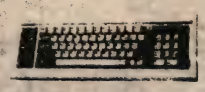
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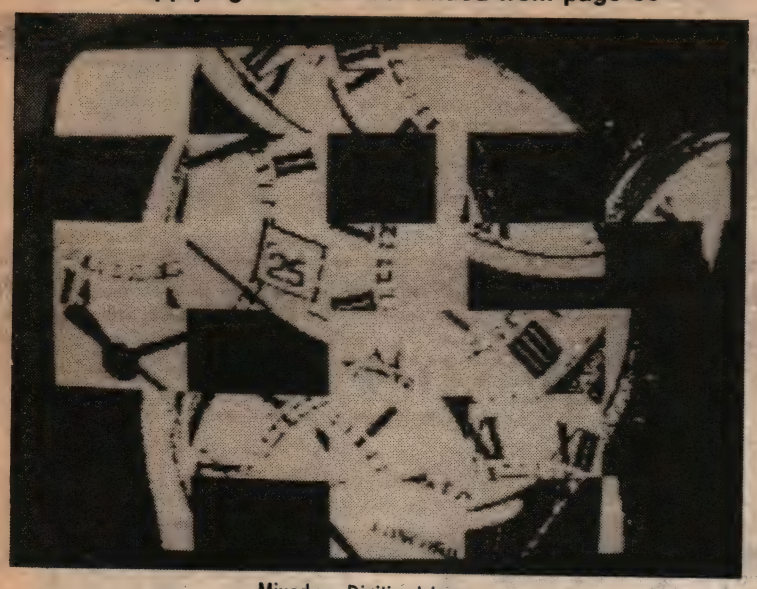
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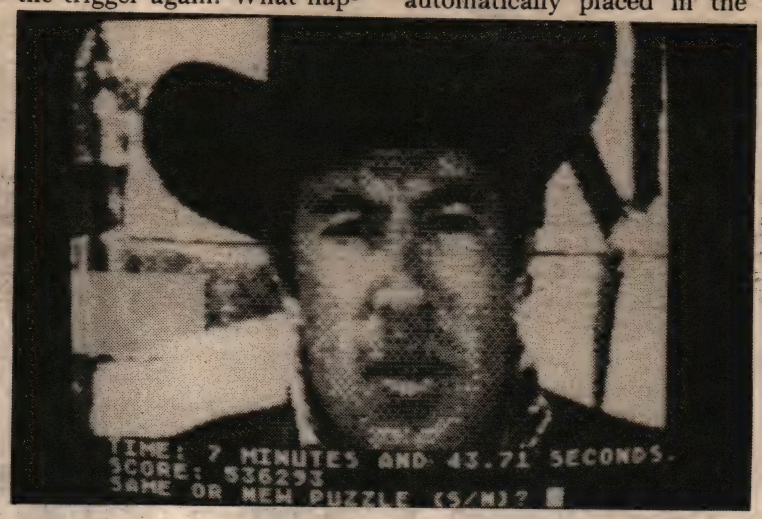
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Applying the Atari continued from page 63



Mixed-up Digitized image

move with it! You can now place this piece of screen down wherever you like by pressing the trigger again. What happens to the section of the image that you just covered with the moved piece, you ask? It is automatically placed in the blank space that the original piece was taken from. Hence, when you move one piece to another, the two exchange places.



A solved puzzle

Scrambling The Screen

Now for the fun stuff. When you press and hold down the OPTION key, the image on the screen will be mixed up. The longer you hold down the OPTION key, the more the pieces of the picture will be mixed up. **Photo 2** shows the picture of the watch after a few seconds of scrambling. When you release the OPTION key, the timer starts. Now use the joystick to put the picture back together.

The Space Bar

At any time while solving the puzzle, you can press and hold down the space bar to see the completed puzzle. When you release the space bar, your unsolved puzzle will return to the screen. The space bar is particularly useful when you first start solving the puzzle, since it allows you to check that you're putting the pieces in their correct positions.

Solving The Puzzle

As soon as you think you've solved the puzzle, press the START key. If your Atari responds with a menacing buzz, you'll know that you've left some pieces out of place. A short, pleasant melody tells you when you've correctly solved the puzzle, and your time and score will be displayed. **Photo 3** shows a puzzle that has just been solved. The time was 7 minutes and 43.71 seconds.

After a puzzle has been solved, you are given the option of trying the same puzzle again, or a new one. If you're playing with a group of people, you'll want each person to try to get the best score on the same puzzle, since each puzzle varies in complexity and difficulty.

Hints and Strategies

Naturally, it's a good idea to look for recognizable pieces when you begin solving a puzzle. For example, if the puzzle is the face of a person, you'll want to look for the eyes and get those into place before continuing with the rest of the puzzle. In the watch picture, the Roman numerals are of great help in putting the picture together, which is why this puzzle is particularly well suited for beginners.

You'll find that some pictures make easy puzzles, while others make incredibly difficult puzzles. Generally, the more defined and clear the original image is, the easier the puzzle will be to solve. In any case, the more you solve a particular

continued on page 162

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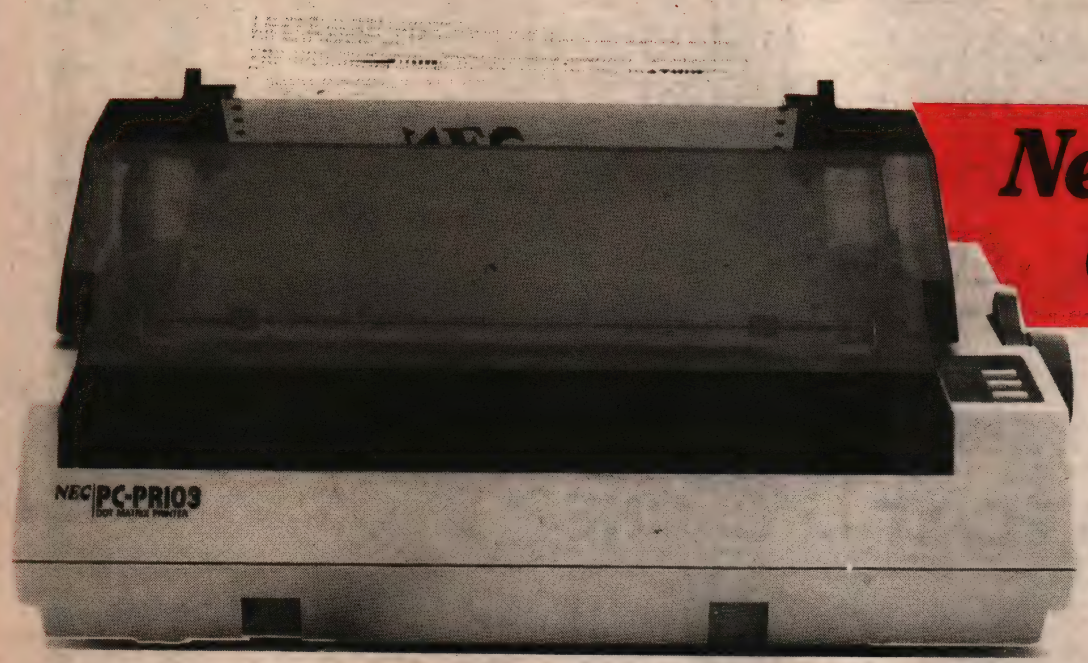
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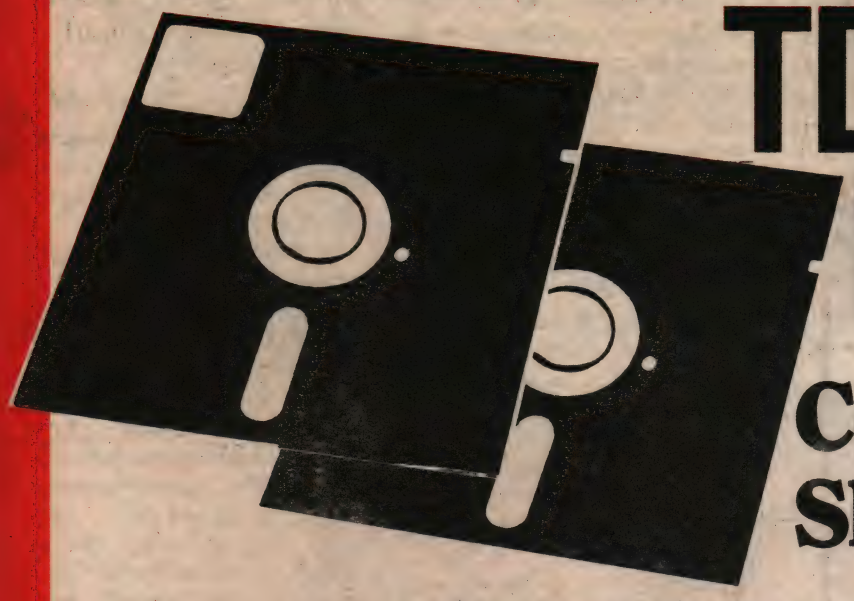
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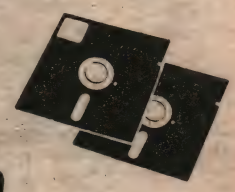
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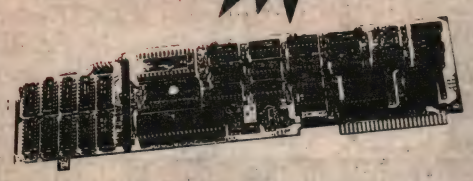


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Atari Book Reviews continued from page 64

only chapter that disappointed me. The many Atari graphics modes are only briefly discussed, and the sound command is hurriedly mentioned in a few brief paragraphs. I suspect that the authors did not feel it was necessary to spend the time that a more complete consideration of the Atari's graphics and sound capabilities would entail. But considering the amount of space given to other topics in the book and the significance of the Atari's graphics and sound capabilities, this section is very much incomplete.

A separate chapter on DOS usage will be a welcome relief to new Atari owners mystified by DOS. A detailed explanation of each of the commands of DOS 2 and the infamous DOS 3 appear in this chapter, along with a generous number of examples.

Chapter 8 may prove to be the most useful for those learning to use Atari BASIC. This chapter is an Atari BASIC Reference Guide and lists each command of Atari BASIC along with a description and an example of its use. In this chapter, the authors partially redeem themselves for their lack of Chapter 6 graphics information, in part by devoting more than ten pages to the COLOR statement. Unfortunately, the sound statement is still neglected here.

The appendices of the *Atari XL User's Handbook* provide an explanation of error messages, a chart of Atari ASCII character set, pinouts for the monitor, serial I/O and joystick jacks, and a listing of important peek and poke locations on the Atari.

Overall, the *Atari XL User's Handbook* is a well-written, practical handbook that contains lots of practical information for new users of the Atari XL computers. The only thing lacking is a discussion of the sound capabilities and graphics wonders of the Atari computers, such as player missile graphics, scrolling and display lists. However, the superficial coverage of graphics and sound is greatly compensated by the wide range of other topics that are so thoroughly covered in this book. At $15.95, the *Atari XL User's Handbook* will prove itself to be a wise investment for the Atari XL owner.

Atari XE User's Handbook

Also published by Weber Systems, Inc. and equally excellent is the *Atari XE User's Handbook*. This handbook is nearly identical to the *Atari XL User's Handbook* but covers DOS 2.5 instead of DOS 3, and includes a chapter on "Advanced Memory Concepts" that discusses bank-switching and how to access the 130XE's extra 64K of memory in BASIC programs. In addition, the section on DOS 2.5 discusses the RAMdisk and its use on the 130XE.

While the 130-page manual included with the 130XE makes it much less crucial to buy a handbook such as *Atari XE User's Handbook*, 130XE owners will still appreciate the additional topics covered in this book and the easy to understand format in which these topics are presented.

Presenting The Atari ST

This is the first in a series of books on the Atari 520ST from Abacus Software (P.O. Box 7211, Grand Rapids, MI 49510). Presenting the Atari ST was written by L. English and J. Halkowiak and was originally published in Germany by Data Becker.

This 197-page book begins with an introduction of the registers and the instruction set of the 68000, the microprocessor of the Atari 520ST. The next chapter covers the architecture of the Atari ST, taking the reader from the RAM and ROM layout of the ST, to the peripheral interfaces (floppy disk, printer, hard disk, DMA, serial RS 232, MIDI, joystick and video interfaces). Included in this chapter is a detailed discussion of the ST's multifunction peripheral chip (the MFP 68901) and the sound capabilities.

Additional chapters in the book cover the ST's own operating system, CP/M, GEM and the mouse, and programming languages. A special chapter on LOGO presents a simple introduction of the commands of this language.

Presenting the Atari ST provides a general overview of a wide range of topics on the 520ST, but it should be stressed that this is not a hands-on guide. Most of the information is presented in a very general manner, with few examples or sample programs. The few sample programs that are included in the book are used to illustrate the 68000 instruction set, and are therefore in assembly language. But for those wishing to learn more about the 520ST before buying, or those who want to get a general understanding of the various aspects of this machine before diving into technical notes and programming books, *Presenting The Atari 520ST* is a good choice, especially since it is one of the few sources of general information on this new machine. ●

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Atari Help
continued from page 63

61101-1437), writes that ICD's RAMBO XL upgrade "is indeed 130XE compatible in the CPU mode. A computer fitted with this upgrade can run the DOS 2.5 RAMdisk, BASIC XE, PaperClip word processor, and Synfile+, as if it was the 130XE." CDY's upgrade is similarly compatible (CDY, 421 Hanbee, Richardson, TX 75080). Garrett Computing (117 Drury Lane, Slidell, LA 70460) offers yet another "Quarter Megabyte Atari 800XL" upgrade for $59.95, which includes RAMs. Dan Garrett says his upgrade runs "some 130XE software" although he doesn't mention whether his upgrade performs 16K or 32K bank switching.

I suspect that all of these 256K upgrades were based on Claus Buchholz's original article in *BYTE*, "The Quarter-Meg Atari," but modified to perform 16K bank switching to make it compatible with the 130XE. I should stress that t hese upgrades are not completely-130XE compatible. The 130XE has the ability to control whether the 6502 or Antic (or both) sees the extra RAM banked through locations $4000 through $7FFF. This permits, for example, a graphics screen to reside in the Atari's normal memory between $4000 and $7FFF while a RAMDISK is in operation. The above mentioned 256K upgrades forgo this feature for the ability to bank in the additional 128K of memory. In most cases, the screen memory is above location $7FFF and there is no problem. But programs that place graphics data between locations $4000 and $7FFF will not work properly. Similarly, some 800 or 800XL programs that utilize this memory area for graphics will not work properly unless the additional RAM is disabled (i.e. not using a RAMDISK).

For those of you have read Claus Buccholz's article in BYTE and are comfortable with soldering or have a friend who will help you out (an Atari users group member, for example) Claus has prepared a special treat for us: A modification to his original article that uses 16K bank switching like the 130XE. It is 130XE compatible except as mentioned earlier. Claus writes:

"The procedure for this upgrade is basically the same as in the article except for the following points: If your Antic (U7) part number is CO21697, use the circuit of the figure [Figure 1], excluding the area inside the dotted lines. If it is

continued on page 164

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Applying The Atari
continued from page 156

puzzle, the faster you'll be able to do it. You may find that you can do a thoroughly mixed watch puzzle in close to a minute after enough practice.

Take advantage of the fact that the cursor returns to the opposite side of the screen when it is moved past an edge. For example, if the cursor is on the right side of the screen and you want to move it to the left side, pushing the joystick to the **right** is the fastest way, since the cursor will return to the left side of the screen once it passes the right edge.

Certainly make use of the space bar, not only when you start solving a puzzle, but near the end too when you may easily miss those few pieces that are out of place. By pressing and releasing the space bar, you can flip back and forth between the original image and your puzzle screen so that any differences become visible to you.

Picture Diskette

I have assembled a disk full of specially centered, high-resolution digitized pictures that you can use with *PixMix*. Also included on the diskette is an add-on utiity that allows *PixMix* to load compressed *MicroIllustrator* files (for Atari Touch Tablet and Koalapad) in Graphics 15 ("Graphics 7.5") four-color format. The "Picture Diskette" is available to readers for $5.00, postpaid. (See address at end of article.)

Next Month

Reader's questions, comments and contributions are welcome. Please enclose a self-addressed, stamped envelope (SASE) for a personal reply.

A diskette of the programs listed in this month's column is available from the author for $7.00, postpaid. Please make checks payable to "Jeff Brenner" an specify your disk drive model.

"Program Perfect" is a utility used to check for typing errors while entering programs from this column. Readers may send $5 for a diskette or a SASE for a listing of this program.

Address all correspondence to Jeff Brenner, "Applying The Atari 3/86" c/o *Computer Shopper*, PO Box F, Titusville, FL 32781-9990. ●

Additional Applying the Atari programs on page 166

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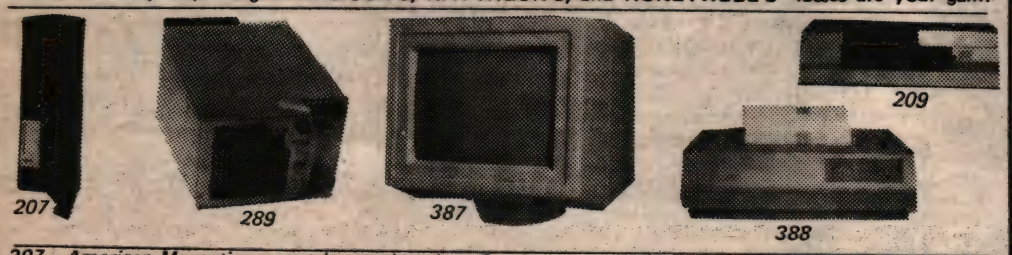
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289. Pioneer Magnetics switching power supply with 750 watts 92-138 VAC, 47-63 Hz 5V @ 100A, 15V @ 2A, 15V @4A, 24V @ 4A, all voltages adjustable +/— 20%; employs latest switching technology, unusually light; good for running souped-up IBM PCAT computer. . . . . $75.00.

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DIGITIZED PICTURE DATA

```
SCE 10 REM DIGITIZED PICTURE DATA LOADER
ESE 15 S=1:C=0:PRINT CHR$(125);"COUNTDOWN: ":POKE 752,1:OPEN #1,4,0,"K:"
QNE 20 DIM A$(3840),C0$(40),C255$(40):C0$=CHR$(0):C0$(40)=CHR$(0):C0$(2)=C0$
GTE 25 C255$=CHR$(255):C255$(40)=CHR$(255):C255$(2)=C255$
DHE 30 POSITION 14,0:PRINT 3840-S;"    "
KDE 35 READ N:IF N>0 AND N<255 THEN A$(S)=CHR$(N):S=S+1:GOTO 30
CLE 40 IF N=-1 THEN GOTO 55
MJE 45 READ A:IF N=0 THEN A$(S)=C0$(1,A):S=S+A:GOTO 30
VLE 50 A$(S)=C255$(1,A):S=S+A:GOTO 30
RXE 55 POKE 752,0:PRINT :PRINT "SAVE TO CASSETTE OR DISK (C/D)?";:GET #1,N
MWE 60 PRINT CHR$(N)
IGE 65 IF N<67 OR N>68 THEN 55
BSE 70 PRINT "PRESS START TO SAVE"
LZE 75 IF PEEK(53279)<>6 THEN 75
QEE 80 IF N=68 THEN PRINT "SAVING AS CLOCK.PIC":OPEN #2,8,0,"D:CLOCK.PIC"
WXE 85 IF N=67 THEN OPEN #2,8,128,"C:"
PKE 90 FOR I=1 TO LEN(A$) STEP 40
MDE 95 PRINT #2;A$(I,I+39);:NEXT I:CLOSE #2
NWE 100 PRINT "COMPLETED.":POKE 752,0:END
DDE 105 DATA 0,6,16,0,3,48,0,1,1,240,3,255,1,191,255,1,251
MPE 110 DATA 255,4,184,0,23,128,0,2,192,0,1,22,0,1,255,1,216,47
CDE 115 DATA 255,6,193,128,0,21,129,0,2,7,128,0,1,192,15,148,127,255,8
ROE 120 DATA 27,32,0,23,52,0,2,1,224,15,255,10,248,0,23,112,24,0,1
JOE 125 DATA 8,6,255,3,7,255,8,32,0,18,16,0,3,128,224,0,2,127
BEE 130 DATA 255,1,252,61,143,255,3,223,255,3,254,253,0,21,1,7,136,0,1
VWE 135 DATA 7,255,2,254,29,199,255,3,227,255,4,223,192,0,16,16,0,3
BIE 140 DATA 12,62,32,0,1,31,255,3,131,227,255,3,227,220,127,255,3,252
VJE 145 DATA 0,6,16,0,13,48,248,6,11,255,4,227,225,255,3,224,120,67
GTE 150 DATA 255,4,128,0,19,67,224,48,15,255,4,240,241,255,3,241,248,199
TAE 155 DATA 255,4,240,0,2,1,64,0,14,1,15,128,128,127,255,4,240,56
IZE 160 DATA 255,3,225,240,135,255,4,254,0,5,1,0,6,2,0,4,16,4
VQE 165 DATA 63,131,3,255,6,8,127,255,2,177,225,143,255,5,192,0,1,2
AHE 170 DATA 128,0,3,64,0,11,255,1,136,15,252,255,4,239,255,3,254,248
WWE 175 DATA 225,15,255,5,240,0,2,128,0,14,3,250,64,31,223,127,255,5
DWE 180 DATA 143,191,255,1,254,195,31,255,6,0,12,32,0,4,7,253,192,255,1
XVE 185 DATA 3,255,4,247,239,255,3,127,248,63,255,6,160,0,1,248,0,13
XAE 190 DATA 1,31,219,3,255,1,240,31,255,2,251,255,1,247,2,7,127,254
PGE 195 DATA 63,255,7,237,0,1,16,0,12,8,0,1,127,254,15,255,2,131
VGE 200 DATA 255,1,254,255,1,248,255,4,188,254,255,7,241,0,1,4,0,14
JWE 205 DATA 254,220,31,255,2,224,23,255,1,254,127,255,5,125,255,7,252,128
ANE 210 DATA 16,0,13,3,253,176,63,255,3,31,63,159,255,6,251,248,255,3
CAE 215 DATA 241,255,3,0,1,12,0,13,39,248,65,255,5,253,255,8,231,255,3
YWE 220 DATA 193,255,3,128,11,0,10,32,0,2,79,244,195,255,4,231,255,12
DUE 225 DATA 254,15,255,3,224,1,0,13,31,241,135,255,4,252,127,255,9,223
BTE 230 DATA 255,1,240,63,255,3,242,0,14,63,207,15,255,3,252,255,2,207
GPE 235 DATA 255,9,191,193,255,4,248,0,14,127,254,31,255,4,207,255,1,225
YLE 240 DATA 255,10,231,255,4,252,32,128,0,9,4,0,2,255,1,204,63,255,3
JVE 245 DATA 223,191,255,1,240,127,255,1,253,255,6,252,127,255,5,2,96,0,11
ECE 250 DATA 1,255,1,252,127,255,3,254,255,2,252,31,255,1,251,239,255,5
XUE 255 DATA 249,255,6,128,32,0,11,1,255,1,248,127,255,6,254,7,255,2
NRE 260 DATA 221,155,255,11,196,96,0,11,11,255,1,240,248,255,2,253,247,255,3
EQE 265 DATA 129,255,2,249,196,255,5,207,255,5,224,48,0,11,15,255,1,113
MPE 270 DATA 255,8,224,255,3,237,246,207,255,9,249,0,12,23,254,227,247,231
AME 275 DATA 255,6,248,31,255,3,238,31,255,4,223,255,4,248,24,0,11,31
HWE 280 DATA 255,1,227,224,0,1,1,239,255,4,254,15,255,3,253,147,111,255,8
YWE 285 DATA 253,64,0,7,32,0,3,31,253,231,207,255,1,127,223,255,5,131
XJE 290 DATA 255,4,248,111,255,4,252,7,255,2,254,4,0,11,63,255,1,227
TNE 295 DATA 192,127,255,1,191,255,5,0,1,255,9,240,0,1,15,255,3,16
YWE 300 DATA 0,11,63,255,1,199,252,0,1,247,129,255,4,252,0,1,63,255,7
XDE 305 DATA 254,0,2,255,4,144,0,11,63,253,207,255,1,248,7,125,255,4
QPE 310 DATA 252,0,1,15,255,7,0,2,15,255,4,120,0,11,127,255,1,207
TSE 315 DATA 255,2,239,255,6,128,3,255,6,0,2,96,31,255,1,240,255,2
BXE 320 DATA 136,0,11,127,255,1,239,255,3,99,255,5,240,1,255,5,128,0,1
PEE 325 DATA 127,255,1,254,0,2,127,255,1,196,0,9,1,0,1,127,255,1
BUE 330 DATA 223,255,9,254,0,1,127,255,3,192,0,1,255,4,15,252,63,255,1
HCE 335 DATA 226,0,11,127,255,1,239,255,10,224,31,255,2,240,0,1,127,255,3
YJE 340 DATA 7,0,2,31,255,1,224,0,11,63,255,1,127,255,2,254,103,255,6
ULE 345 DATA 252,0,1,31,224,0,1,63,255,5,131,255,3,224,0,11,127,254
WWE 350 DATA 127,255,11,0,3,31,255,5,253,255,4,241,0,11,63,255,4,254
VRE 355 DATA 247,255,7,0,2,7,255,6,129,255,4,243,0,11,127,255,1,127
YRE 360 DATA 255,2,254,87,255,7,0,2,127,255,11,241,0,11,63,255,13,0,2
HLE 365 DATA 127,255,11,240,0,11,31,255,1,127,255,2,239,251,255,7,128,0,1
TIE 370 DATA 15,255,6,192,255,4,240,0,11,31,255,1,63,255,1,192,7,3
VFE 375 DATA 255,7,224,0,1,195,255,11,248,0,11,31,255,2,192,0,1,247
GNE 380 DATA 255,8,254,7,248,63,255,10,248,128,0,10,31,255,1,223,199,240
DKE 385 DATA 3,255,11,135,255,5,230,255,4,248,0,11,15,255,1,223,224,0,1
HRE 390 DATA 123,192,255,10,240,255,5,224,255,4,249,128,0,10,15,255,1,231
EUE 395 DATA 224,254,1,223,255,10,254,31,255,4,239,199,255,3,249,0,7,32
SME 400 DATA 0,3,15,255,1,231,240,0,1,2,255,12,195,255,4,207,255,1
AHE 405 DATA 15,255,2,240,0,11,7,255,1,247,248,47,255,1,246,63,255,10
BVE 410 DATA 248,127,255,3,223,255,1,252,31,255,1,241,0,11,7,255,1,249
DZE 415 DATA 248,255,2,251,255,12,15,255,3,155,255,2,248,255,1,240,0,11
LNE 420 DATA 3,255,1,253,255,2,128,125,255,12,241,255,3,191,255,2,253,255,1
LUE 425 DATA 240,128,0,10,3,255,1,252,127,248,7,254,247,255,11,254,63,255,2
BFE 430 DATA 60,231,255,1,249,255,1,224,0,11,3,255,1,254,127,0,1,255,2
ALE 435 DATA 127,255,5,253,255,6,199,255,2,127,242,3,255,2,224,0,11,1
IIE 440 DATA 255,2,143,143,255,8,248,255,1,127,255,4,248,255,1,254,124,12
HRE 445 DATA 127,251,255,1,230,0,11,1,255,2,207,255,3,254,255,6,126,255,6
JKE 450 DATA 31,252,249,255,1,231,247,255,1,206,128,0,10,1,255,2,231,255,8
EFE 455 DATA 63,255,1,240,255,6,227,248,63,205,247,247,255,1,140,0,11,1
EKE 460 DATA 255,2,241,255,9,162,127,255,6,252,127,153,255,1,7,255,2,20
CSE 465 DATA 0,12,255,2,252,255,4,159,255,3,247,255,1,206,63,255,6,135
EME 470 DATA 191,231,255,1,239,255,1,12,0,12,255,2,254,95,255,9,254,253
NPE 475 DATA 255,6,128,255,2,143,223,254,142,15,128,0,10,127,255,2,143,255,2
LNE 480 DATA 193,254,31,255,5,231,255,6,120,31,255,2,159,252,240,0,12,255,3
FPE 485 DATA 203,255,2,6,120,255,12,253,255,1,231,255,3,253,252,0,12,127
IEE 490 DATA 255,2,243,255,1,248,24,31,252,255,11,247,255,1,252,255,3,243
NXE 495 DATA 248,0,12,127,255,2,253,255,1,224,224,255,13,223,255,2,159,255,2
LPE 500 DATA 231,248,0,12,127,255,3,62,7,135,255,2,243,255,10,207,248,255,4
KHE 505 DATA 207,224,0,12,127,255,1,247,255,1,239,156,31,241,254,239,255,9
ICE 510 DATA 251,247,224,63,255,3,63,192,0,12,127,255,1,207,255,1,247,192
BXE 515 DATA 126,7,255,2,231,255,10,135,15,255,2,254,63,0,13,127,255,1
MHE 520 DATA 129,255,1,252,121,239,15,255,2,191,255,9,124,112,195,255,2,249
WXE 525 DATA 255,1,1,224,0,11,63,255,1,128,127,255,1,62,126,31,255,3
JSE 530 DATA 191,255,6,191,255,1,242,28,48,255,1,254,224,200,0,13,63,255,1
ELE 535 DATA 128,31,255,1,3,252,63,255,2,254,127,63,255,4,207,255,1,127
UBE 540 DATA 225,135,12,31,255,1,130,120,0,13,127,255,1,0,1,7,255,1
SBE 545 DATA 225,224,127,255,3,252,127,254,127,159,227,255,1,231,255,1,248,112
VBE 550 DATA 193,31,254,5,224,0,13,127,255,1,0,2,255,1,252,29,255,3
KBE 555 DATA 252,127,230,255,3,243,243,255,2,254,12,48,63,184,118,224,0,13
CEE 560 DATA 127,255,1,0,2,31,255,1,195,255,3,254,31,255,1,248,125,253
DWE 565 DATA 131,255,4,195,132,254,224,125,128,0,13,127,254,0,2,3,255,1
EQE 570 DATA 249,255,3,252,63,63,255,8,240,231,255,1,3,178,0,14,127,254
ANE 575 DATA 0,3,255,2,63,255,2,252,126,63,255,3,254,255,4,252,31,252
EDE 580 DATA 2,188,0,14,127,252,0,3,15,255,1,247,255,2,248,124,63,255,3
JYE 585 DATA 254,127,255,5,224,31,248,0,14,127,252,0,4,255,1,254,127,255,1
ETE 590 DATA 248,248,63,255,3,254,31,255,5,128,238,160,0,14,127,248,0,4
ENE 595 DATA 31,255,1,231,255,1,240,254,63,255,3,254,15,255,4,248,1,219
WRE 600 DATA 128,0,14,255,1,240,0,4,3,255,1,254,127,225,222,63,255,4
RHE 605 DATA 199,255,4,128,0,1,43,0,15,255,1,240,0,5,63,255,1,243
VDE 610 DATA 252,62,63,255,4,225,255,3,248,0,1,1,248,0,15,255,1,224
STE 615 DATA 0,5,3,255,2,143,254,63,255,4,248,255,3,0,2,1,112,0,15
XLE 620 DATA 255,1,192,0,6,63,255,1,252,51,255,5,248,63,255,1,224,32
LGE 625 DATA 0,1,1,64,0,15,255,1,192,0,6,3,255,2,252,255,7,240
UIE 630 DATA 31,224,0,1,51,0,16,255,1,128,0,7,31,255,2,252,31,255,4
RBE 635 DATA 240,15,255,1,224,0,1,62,0,16,255,1,128,0,8,127,255,3
HIE 640 DATA 192,0,2,7,255,3,128,0,1,120,0,16,62,0,9,1,255,9
MQE 645 DATA 254,0,2,32,0,16,14,0,10,7,255,8,192,0,1,1,128,0,16
FAE 650 DATA 12,0,12,255,6,0,3,6,0,36,1,128,0,1,62,0,37,128
XVE 655 DATA 0,1,16,0,36,1,0,2,160,0,36,1,0,1,3,192,0,36
WYZ 660 DATA 2,0,1,2,0,37,2,0,1,14,0,12,-1
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Atari Help
continued from page 161

CO12296, include the circuit inside the dotted lines. The circuit requires five connects to the PIA (U23). So, pines 12 through 16 must be bent up and connected to the circuit. The rest of the procedure is the same. Notice that this circuit has one more chip than the article's circuit. This is the price of compatibility.

"With the 256K dynamic RAMs in your XL, be sure to wait at least ten seconds after turning the computer off. Otherwise it may not coldstart properly when you turn it back on. My original RAMdisk software doesn't work with this new mod. You may download [the new version] from the Capital Hill Atari Owners' Society BBS at 517-371-1106 or from the Castle Communications board at 517-371-4234. The source file is called QMEGXLD.SRC for QuarterMEG XL Double. Also available is a RAMdisk program that sets up one single-density RAMdisk and leaves the XE-equivalent banks free for XE software. This is quite useful with BASIC XE, DOS 2.5, or the new Synapse software. Its name is QMEGXLS. SRC.

"I ask one thing in return for this information: Please pass it around to all your interested friends. Put it in your club's library or on your favorite BBS. Encouraging software support of 256K will result in many interesting uses for it. Thank you and enjoy --

Claus Buchholz."

We owe a thousand thanks to Claus Buchholz and the C.H.A.O.S. users group of Lansing, Michigan. Figure 1 shows the parts list, the memory control register, and the schematic diagram.

Other upgrades: Inspired by Claus Buchholz's article, David G. Byrd (1513 Commanche Drive, Las Vegas, NV 89109) has written a public domain article, "The Atari 800-Plus 256K," which gives 288K total memory for the Atari 800.

Tiny Tek (Rt. 1, Box 795, Quinlan, TX 75474) still offers its 48/52K upgrade for the Atari 400. "Sandy" Sandberg of Azure Electronics (1020 Price St. "E," Pismo Beach, CA 93449) writes of the Tiny Tek board "I have been installing these boards for customers for several years. Please inform your readers of this memory replacement board which makes the 400 actually have a larger memory than the 800 (unexpanded) due to the hidden 4K at $C000 to $CFFF.

In response to Robert Harren's question on interfacing his Atari to a shortwave communications receiver (in the January 1986 "Atari Help") Bob Allman and Patrick Campbell wrote to recommend an article published in the November 1985 issue of *ANTIC*, "Morse Code Receiver by Steve Stuntz." Bob also suggests a look at the December 1985 issue of 73 for *Radio Amateurs*, which published another one-chip tone detector circuit for facsimile transmissions.

My thanks to all readers who wrote in to Help including R.J. Allman of M.A.S.H. (Millington, TN), Patrick Campbell (Birmingham, AL), Dan Garrett of Garrett Computing (Slidell, LA) Thomas Harker of ICD (Rockford, IL), John Kirkpatrick of Caledonia Enterprises (Sumter, SC), Dick Litchfield of STATUS (Virginia Beach, VA), S.D. Martin (Washington D.C.), Newell Industries (Wylie, TX), "Sandy" Sandberg (Pismo Beach, CA), and Jeffrey R. Wilson of SSI Software (Orem, UT).

Q. Thanks for a great column in *Computer Shopper*. I have several questions about the 800XL:

1) I cannot get the Microprose *Solo Flight* to load. The program will go as far as the title screen and freeze up. I've tried every combination of switch (down, up, same time) I can think of. That Atari Translator doesn't do anything either.

2) I have a Microperipheral Corp. modem. The problem is I cannot locate any software that will access this modem. The only software that works is the one that came with it that I typed in. I have tried Amodem, HomeTerm, etc. and they all give me a modem error.

3) Last question: Is the keypad program for 11/85 for the external keypad that connects to the joystick ports?

H. Wayne Shiver
Powder Springs, GA

A. We didn't have any trouble loading *Solo Flight* on our 800XL. You should only need to hold down the OPTION key while you turn on your computer (with the diskette in the disk drive). The translator disk is not needed. If you continue to have problems, it could be your diskette. Contact MicroProse for a replacement (10616 Beaver Dam Road, Hunt Val-

continued on page 166

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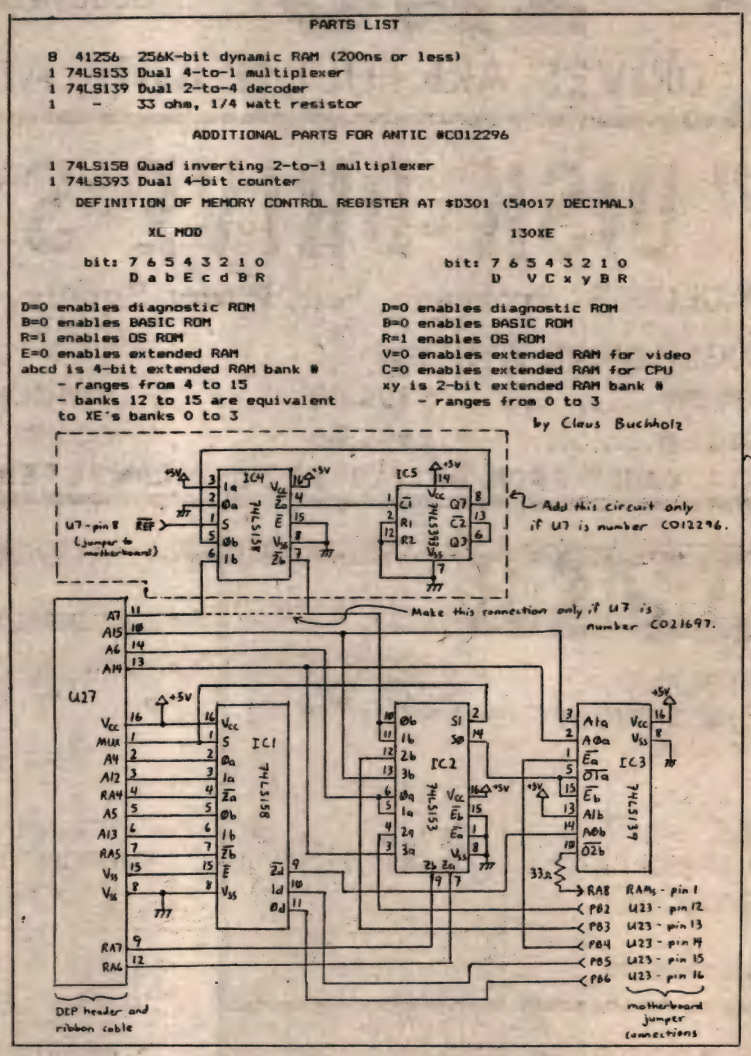
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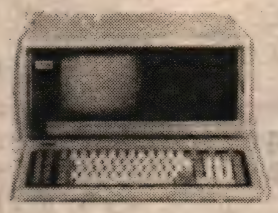
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U	S	R	O	B	O	T	I	C	S	H	O	O
M	F	U	D	U	D	F	F	F	W	W	H	R
Y	U	A	E	A	S	T	T	I	N	C	C	P
B	T	O	M	H	V	J	L	W	E	A	N	K
A	S	W	S	A	T	L	S	T	A	T	A	R
B	O	D	D	F	E	E	I	P	J	R	F	O
Y	R	I	U	W	Y	T	M	T	G	Y	E	W
N	C	L	X	A	L	N	B	O	X	A	B	T
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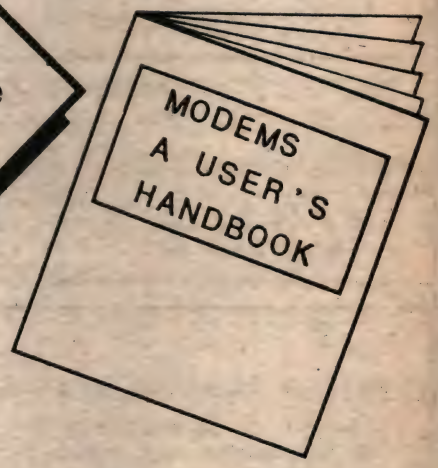
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MODEMS

Atari Help continued from page 164

ley, MD 21030, 301-667-1151).

Regarding your question about software for the MPP modem series, several programs that support this modem are in the public domain. These include *MSCOPE MPP*, which lets you download from CompuServe, *VT100 Terminal Emulator*, which features an 80-column, DEC-compatible display, and *HomePak* Customizer Disk which includes a special handler for the MPP modem. Your local users group may have these programs available, or a friend can download them for you from an Atari BBS. *ANTIC* (524 Second St., San Francisco, CA 94107) also offers these on diskette for $10.00 per program.

November's Keypad program is indeed for the Atari CX85 keypad that plugs into the joystick ports. I have more information on this keypad planned for future months.

Q. The joystick ports on the XL are able to supply a +5vdc switched output to an external device. I remember reading this at some time, but do not remember the details; and whatever the publication, it is now long gone. Would you know how to control this output?

A. David Alan Hayes' article, "Control Your Environment with the Atari 400/800," (*BYTE*, July 1983) is exactly what you are looking for, and I have recommended this well-written article in the past. You can probably find it in your local library. David discusses using the four joystick ports on the Atari 400 or 800, but what is said also applies to the two joystick ports on the XL/XE units. (Incidentally, the XL and XE machines use the other two ports internally to control the switching in and out of RAM and ROM, and to specify the memory banks on the 130XE.)

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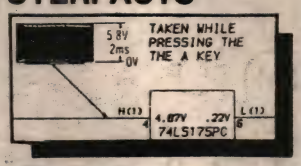


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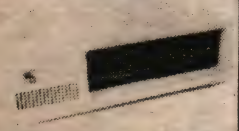
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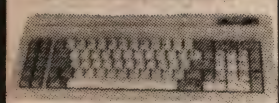
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Applying Atari Programs continued from page 162

PIXMIX PUZZLE MACHINE

```
YJJ 10 REM PIXMIX PUZZLE MACHINE
KGJ 20 REM COPYRIGHT 1986 JEFF BRENNER
ENJ 30 DIM PM$(176),C1$(48),C2$(48),TEMP$(25),FILE$(25),A$(10),B$(10)
MKJ 40 OPEN #1,4,0,"K:":GOSUB 160
TCJ 50 C1$=PM$:C1$(17)=CHR$(255):C1$(32)=CHR$(255)
MAJ 60 C1$(18,31)=C1$(17,32):C1$(LEN(C1$)+1)=PM$
YWJ 70 DIM GT$(57),PT$(53),SCR$(7680),MOVE$(56),CMP$(65),SWAP$(62),CIO$(7)
IUJ 80 GOSUB 930:DIM P$(320),HOLD$(320):P$(320)=CHR$(0)
KKJ 90 POKE 106,PEEK(106)-16:GRAPHICS 24:GOSUB 720:J=PEEK(88)+256*PEEK(89)
NXJ 100 RESTORE 110:FOR I=1664 TO 1684:READ N:POKE I,N:NEXT I:A=USR(1664)
PIJ 110 DATA 104,162,6,160,138,169,7,76,92,228,165
YVJ 120 DATA 20,41,247,141,192,2,76,98,228
BRJ 130 PM=PEEK(106):POKE 54279,PM:POKE 53277,3:POKE 53248,0
FSJ 140 V=PEEK(134)+256*PEEK(135):A=PEEK(140)+256*PEEK(141):OS=PM*256+512-A
NDJ 150 H=INT(OS/256):L=OS-H*256:POKE V+2,L:POKE V+3,H:GOSUB 160:GOTO 170
SGJ 160 PM$(1)=CHR$(0):PM$(176)=CHR$(0):PM$(2)=PM$:RETURN
YMJ 170 X=48:Y=48:PM$(Y-47,Y+48)=C1$:POKE 53256,3
UAJ 180 DIM JX(10),JY(10)
FAJ 190 RESTORE 200:FOR I=0 TO 9:READ X1,Y1:JX(I)=X1:JY(I)=Y1:NEXT I
FUJ 200 DATA 32,16,32,-16,32,0,0,0,-32,16,-32,-16,-32,0,0,0,0,16,0,-16,0,0
NDJ 210 GRAPHICS 8+32:GOSUB 720
PNJ 220 TEMP$="":CLOSE #3:PRINT "CASSETTE OR DISKETTE (C/D)? ";
OWJ 230 GET #1,D:PRINT CHR$(D):IF D<67 OR D>68 THEN 220
PNJ 240 IF D=68 THEN PRINT "LOAD WHAT PICTURE FILE? D:";:INPUT #16;TEMP$
EHJ 250 IF LEN(TEMP$) OR D<>68 THEN 340
PUJ 260 TRAP 330:PRINT "DIRECTORY (PRESS RETURN OR Y)":OPEN #2,6,0,"D:*.*"
NRJ 270 INPUT #2;FILE$:IF FILE$(2,2)<>CHR$(32) THEN 330
VVJ 280 A$=FILE$(1,10):PRINT A$;".";FILE$(11,13);"?";CHR$(32);
BCJ 290 GET #1,N:PRINT CHR$(N):IF N<>89 THEN 270
CCJ 300 IF A$(LEN(A$))=CHR$(32) THEN A$=A$(1,LEN(A$)-1):GOTO 300
ETJ 310 TEMP$=A$(3):TEMP$(LEN(TEMP$)+1)=".":TEMP$(LEN(TEMP$)+1)=FILE$(11)
WOJ 320 CLOSE #2:GOTO 340
QCJ 330 TRAP 40000:PRINT :CLOSE #2:GOTO 240
EOJ 340 FILE$=CHR$(D):FILE$(2,2)=":":FILE$(LEN(FILE$)+1)=TEMP$
QDJ 350 POKE 881,0:TRAP 220:OPEN #3,4,0,FILE$
WQJ 360 H=INT(ADR(SCR$)/256):L=ADR(SCR$)-H*256:POKE 884,L:POKE 885,H
ASJ 370 POKE 888,0:POKE 889,30:POKE 882,7:A=USR(ADR(CIO$),48):CLOSE #3
XCJ 380 TRAP 40000:A=USR(ADR(MOVE$),ADR(SCR$))
ADJ 390 GRAPHICS 8+16+32:GOSUB 720:POKE 53248,48
KHJ 400 POKE 18,0:POKE 19,0:POKE 20,0:TF=0
HQJ 410 I=0:D=STICK(0)-5:IF D=10 THEN 540
PRJ 420 SOUND 3,0,1,6:SOUND 3,0,1,0:POKE 77,0
YZJ 430 X=X+JX(D):Y=Y+JY(D):IF X<48 THEN X=176
ABJ 440 IF X>176 THEN X=48
YAJ 450 IF Y<48 THEN Y=128:GOSUB 160
YDJ 460 IF Y>128 THEN Y=48:GOSUB 160
YXJ 470 IF HOLD$="" THEN FOR DL=1 TO 14:NEXT DL
KRJ 480 POKE 53248,X
VPJ 490 PM$(Y-47,Y+48)=C1$
MSJ 500 IF LEN(HOLD$)=0 THEN 540
QMJ 510 A=USR(ADR(PT$),ADR(P$),S)
QIJ 520 S=J+(X-48)/4+(Y-48)*80:A=USR(ADR(GT$),ADR(P$),S)
YVJ 530 A=USR(ADR(PT$),ADR(HOLD$),S)
IEJ 540 SOUND 0,0,0,0:IF PEEK(764)=33 THEN GOSUB 730
QJJ 550 FL=0:IF PEEK(53279)=3 THEN GOSUB 660
ENJ 560 IF PEEK(53279)=6 THEN GOSUB 760
EHJ 570 IF STRIG(0) THEN 410
LYJ 580 SOUND 0,0,6,6
AGJ 590 S=J+(X-48)/4+(Y-48)*80:IF HOLD$="" THEN 620
KJJ 600 HOLD$="":IF S<>OS THEN S=OS:A=USR(ADR(PT$),ADR(P$),S)
BQJ 610 GOTO 640
FFJ 620 OS=S:A=USR(ADR(GT$),ADR(P$),S)
CFJ 630 HOLD$=P$:P$=CHR$(0):P$(320)=CHR$(0):P$(2)=P$
IPJ 640 IF STRIG(0)=0 THEN 640
BWJ 650 GOTO 480
DAJ 660 XX=INT(RND(0)*5):YY=INT(RND(0)*6):S=J+XX*8+YY*128
PGJ 670 IF FL=0 THEN FL=1:A=USR(ADR(GT$),ADR(P$),S):S1=S:HOLD$=P$:GOTO 660
RMJ 680 A=USR(ADR(GT$),ADR(P$),S):A=USR(ADR(PT$),ADR(P$),S1):S1=S
NNJ 690 IF PEEK(53279)=3 THEN 660
DFJ 700 IF TF=0 THEN TF=1:POKE 18,0:POKE 19,0:POKE 20,0:SOUND 0,11,12,10
RIJ 710 A=USR(ADR(PT$),ADR(HOLD$),S1):HOLD$="":RETURN
MPJ 720 POKE 559,46:POKE 710,0:POKE 16,64:POKE 53774,64:POKE 764,255:RETURN
XKJ 730 A=USR(ADR(SWAP$),ADR(SCR$))
RGJ 740 IF PEEK(53775)=251 THEN 740
XEJ 750 POKE 764,255:A=USR(ADR(SWAP$),ADR(SCR$)):RETURN
XSJ 760 A=USR(ADR(CMP$),ADR(SCR$)):IF PEEK(208)=0 THEN 780
SFJ 770 SOUND 0,45,6,8:FOR I=1 TO 100:NEXT I:SOUND 0,0,0,0:RETURN
NKJ 780 TM=(PEEK(20)+256*PEEK(19)+256*PEEK(18))/60-0.21:RESTORE 820
JDJ 790 FOR I=0 TO 3:READ N:FOR V=12 TO 0 STEP -1:SOUND I,N,10,V:NEXT V
LYJ 800 NEXT I:FOR I=53761 TO 53767 STEP 2
ASJ 810 POKE I,166:NEXT I:FOR I=1 TO 90:POKE 712,I:NEXT I
XFJ 820 DATA 243,193,162,121
EWJ 830 SOUND 1,29,10,8:SOUND 3,11,10,8:POKE 710,12:FOR I=1 TO 100:NEXT I
KBJ 840 POKE 710,0:POKE 712,0:FOR I=0 TO 3:SOUND I,0,0,0:NEXT I
ANJ 850 GRAPHICS 8+32:GOSUB 720:PRINT CHR$(125);"TIME: ";:POKE 559,46
LHJ 860 M=INT(TM/60):S=TM-M*60
HRJ 870 PRINT M;" MINUTES AND ";INT(S*100+0.5)/100;" SECONDS."
TFJ 880 PRINT "SCORE: ";INT((1000-TM)*1000+0.5)
XZJ 890 PRINT "SAME OR NEW PUZZLE (S/N)? ";:GET #1,N:PRINT CHR$(N)
SXJ 900 IF N<>83 AND N<>78 THEN 890
SSJ 910 IF N=78 THEN 220
TUJ 920 A=USR(ADR(MOVE$),ADR(SCR$)):GOTO 390
RLJ 930 POKE 559,0:RESTORE 940:FOR I=1 TO 57:READ N:GT$(I,I)=CHR$(N):NEXT I
KXJ 940 DATA 104,104,133,205,104,133,204,104,133,207,104,133,206,162,32,160
DCJ 950 DATA 7,177,206,145,204,169,0,145,206,136,16,245,24,165,206,105
EEJ 960 DATA 40,133,206,165,207,105,0,133,207,165,204,105,8,133,204,165
FEJ 970 DATA 205,105,0,133,205,202,208,215,96
NCJ 980 GOSUB 1210:FOR I=1 TO 53:READ N:PT$(I,I)=CHR$(N):NEXT I
LCJ 990 DATA 104,104,133,205,104,133,204,104,133,207,104,133,206,162,32,160
GIJ 1000 DATA 7,177,204,145,206,136,16,249,24,165,206,105,40,133,206,165
```

programs continued on page 167

Free Software
continued from page 66

Megariods is an ST version of the arcade classic Asteroids, that runs in both high and medium res. It was written by Mike and Mitch Bunnell of Megamax Inc. As a demonstration program for their Megamax C compiler. This is an excellent rendition of the arcade game. With outstanding 3-D astroids and good sound effects. Its not as good as the arcade version of the game it's better.

You can get Megariods from the same places that you get either ST Writer or NEOchrome. But you can't get the source code for ST Writer or NEOchrome anywhere (unless you have unscrupulous friends at Atari). You can however get the C source code for Megariods (hard copy listing only) by sending $25 to Megamax at the address below. If properly commented it should prove invaluable as a learning aid in mastering C on the ST.

Megamax Inc.
P.O. Box 851521
Richardson, TX 75085-1521
ATT: ST Megariods Source
(214) 987-4931

The Megamax C compiler can also be ordered from the same address for $199.95. The advertising copy for the compiler sounds impressive. Full K&R plus common extensions. It features full floating point, one pass compilation optimized for 68000, smart linker, librarian, dynamic overlays, creates stand alone ST applications, in-line assembly language, batch facilities, and no license fees. However, until we see the compiler ourselves, we can't say if it is as good as it sounds. But one thing for user it was capable of creating one great program in Megariods.

The public domain library for the ST contains many more than just these three programs. To get the most out of your investment in a 520ST it would behoove you to be aware of the excellent software available free for the asking. The best way to do this is to join a users group. The local ST UG already has nine disks full of public domain stuff, with more programs being added every week. Some other groups have much larger collections.

No you won't find a free program to fill your every need. But it will surprise you to know just how many good programs there are. And communicating with other users is one of the best ways to get an unbiased opinion of any commercial packages you are interested in. As always the *Computer Shopper* will try to keep you up to date. But the more sources of information you have the better off you will be. ●

Applying Atari Programs
continued from page 166

```
DGJ 1010 DATA 207,105,0,133,207,165,204,105,8,133,204,165,205,105,0,133
FRJ 1020 DATA 205,202,208,219,96
TLJ 1030 FOR I=1 TO 56:READ N:MOVE$(I,I)=CHR$(N):NEXT I
LYJ 1040 DATA 104,104,133,205,104,133,204,165,88,133,206,165,89,133,207,162
ILJ 1050 DATA 192,160,39,177,204,145,206,136,16,249,24,165,204,105,40,133
HMJ 1060 DATA 204,165,205,105,0,133,205,24,165,206,105,40,133,206,165,207
YKJ 1070 DATA 105,0,133,207,202,208,218,96
QHJ 1080 FOR I=1 TO 65:READ N:CMP$(I,I)=CHR$(N):NEXT I
JYJ 1090 DATA 104,104,133,205,104,133,204,169,0,133,208,165,88,133,206,165
IXJ 1100 DATA 89,133,207,162,192,160,39,177,204,209,206,208,33,136,16,247
FHJ 1110 DATA 24,165,204,105,40,133,204,165,205,105,0,133,205,24,165,206
NMJ 1120 DATA 105,40,133,206,165,207,105,0,133,207,202,208,216,96,230,208,96
TNJ 1130 FOR I=1 TO 62:READ N:SWAP$(I,I)=CHR$(N):NEXT I
LZJ 1140 DATA 104,104,133,205,104,133,204,165,88,133,206,165,89,133,207,162
KOJ 1150 DATA 192,160,39,177,204,72,177,206,145,204,104,145,206,136,16,243
FMJ 1160 DATA 24,165,204,105,40,133,204,165,205,105,0,133,205,24,165,206
RNJ 1170 DATA 105,40,133,206,165,207,105,0,133,207,202,208,212,96
QDJ 1180 FOR I=1 TO 7:READ N:CIO$(I,I)=CHR$(N):NEXT I
TDJ 1190 DATA 104,104,104,170,76,86,228
CPJ 1200 RETURN
NFJ 1210 A$="PIXMIX":DIM X(6),Y(6),C(2):GRAPHICS 2:POKE 710,0:N=0
QQJ 1220 POKE 708,66:POKE 709,216:POKE 711,148
FAJ 1230 C(0)=0:C(1)=32:C(2)=160
GFJ 1240 FOR I=1 TO 6:X(I)=5+INT(RND(0)*10):Y(I)=INT(RND(0)*10)
RRJ 1250 POSITION X(I),Y(I):PRINT #6;CHR$(ASC(A$(I,I))+C(N)):N=N+1
TSJ 1260 IF N=3 THEN N=0
ASJ 1270 NEXT I
VKJ 1280 B=1:FOR I=1 TO 6
QWJ 1290 X=X(I):Y=Y(I)
USJ 1300 SOUND 1,X(I)*4,10,8:SOUND 2,Y(I)*4,10,8
CLJ 1310 IF Y(I)>5 THEN Y(I)=Y(I)-1:B=0
CIJ 1320 IF Y(I)<5 THEN Y(I)=Y(I)+1:B=0
GXJ 1330 IF X(I)>I+6 THEN X(I)=X(I)-1:B=0
GUJ 1340 IF X(I)<I+6 THEN X(I)=X(I)+1:B=0
AWJ 1350 POSITION X,Y:PRINT #6;CHR$(32);:POSITION X(I),Y(I):PRINT #6;A$(I,I)
NFJ 1360 POSITION X(I),Y(I):A=ASC(A$(I,I)):PRINT #6;CHR$(A+C(N))
IXJ 1370 N=N+1:IF N>2 THEN N=0
NKJ 1380 NEXT I:IF B=0 THEN 1280
TQJ 1390 POKE 752,1:POKE 657,13:PRINT "PUZZLE MACHINE"
XHJ 1400 POKE 657,7:PRINT "Copyright 1986 Jeff Brenner":POKE 53768,1
OEJ 1410 FOR I=1 TO 36
WNJ 1420 N=PEEK(711):POKE 711,PEEK(709):POKE 709,PEEK(708):POKE 708,N
VZJ 1430 NEXT I:PRINT :POKE 657,15:PRINT "STAND BY...";
TIJ 1440 SOUND 1,0,0,0:SOUND 2,0,0,0
DFZ 1450 POKE 752,0:RETURN
```


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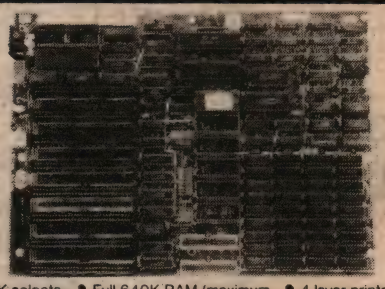
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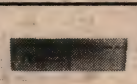
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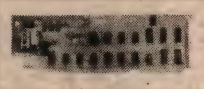
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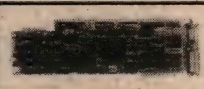

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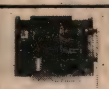

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GATO Submarine Simulation

by Lon Andrews

Ever since I watched John Wayne sink his first enemy destroyer and then run for cover I have been in love with the old submarines. As a kid I went on one off the old Million Dollar Pier in St. Petersburg and experienced a thrill that has lasted all my ife. I can still smell the odors in that sub today when I am feeling nostalgic. And then along came GATO from Spectrum Holobyte Inc. It was like giving my kids a train set for Christmas. You know who gets the bigger kick out of the "toys." When I sat down and booted up the program my wife was heard to mutter "Good Lord! Now he's got a submarine!" as she went out of the room.

GATO is a simulation of the World War II Gato class attack submarines that were one of the main strengths of the Navy, particularly in the south Pacific. The missions are run in real time to the consternation of some players. They are accustomed to taking all the time in the world to make a game decision. GATO events happen as they would in "real" life, even when you do nothing something will, or may be happening in the game. In other words you can't get up and go to dinner and expect the mission to wait on you. The program does "pause" when you call for a damage report. There are 20 "missions" on the disk and you can create up to 10 more.

As you start the game you receive a mission from "COMSUBPAC" by way of morse code. Thankfully this is translated on the screen for those of us that don't remember Morse Code from Scouts or service. Once the message is received you make use of four screens, radar, quadrant, damage repair and main screen to plot your way to the objective and carry out the mission. There are twenty quadrants to maneuver through in the various missions.

You, as the skipper of the sub, must take into account many variables in order to complete the missions. The instrument panel provides information concerning depth, speed, heading, fuel, battery,

continued on page 171

Ask The Guru
continued from page 155

your data points with a pin or needle. Then you hand enter the points into *Applewriter* and you are all set. A light box makes things even easier.

Any variations from your original art are also easily done. You can pick off only the part of the image you really need. You can also change the shape and size of things as you go along, adding or dropping detail. Try doing that on a digitizer or a scanner!

Once again, remember that you need suprisingly few data points for a curvetrace, so doing things by hand is not that tedious or time consuming a job at all.

Names & Numbers

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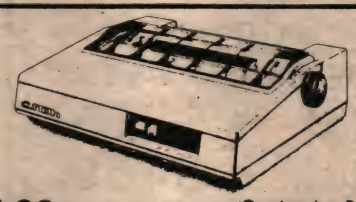
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Review of Newpoker continued from page 151

self-explanatory. Here, however, I saw a lot of clusters of three cards each and found them and the brief instruction below cryptic. Aha. I see. You move a card by moving the cursor. To where? And so it went as I went on without looking at the manual for help.

Since Solitaire is not really my speed, I won't tell you how I did that game. A few years ago I did a mathematical analysis of a related game, Clock Solitaire, and that was about as much as I wanted with these games, even though ordinary Solitaire has some choice and perhaps skill to it, at least. (Incidentally, if anybody would like a copy of that little mathematical article, please send me 50 cents for photocopying and a self-addressed stamped envelope. Write me at the address at the end of article.)

Now that I've made my excuses about Solitaire, I can tell you that it was at this point that I discovered that the program had redefined the function keys to allow easy running of the menu program. Remember, I was doing all of this without looking at the little manual of about a half dozen pages, in accord with my reviewer fantasy. And so far, doing pretty well, I might add. So, now I was ready for Poker Squares, whatever they might be!

Ah! An almost mathematical problem. Given 25 cards, arrange them in a 5x5 grid so as to form the best 10 poker hands you can (five columns, five rows). The program contains scores for various possible hands, with 2 for a pair and 100 for a royal flush. But the program had a luck feature built in. The 25 cards are selected by you, in effect, telling the computer to stop as it quickly flashes lots of cards by you. You then place the cards as each is picked. Now this was both fun and challenging, as well as stimulating. The nice thing about a game such as this is that there is such a variety of levels it can be played on. Casual, studied, deeply theoretical: all are rewarded and you will like to play this to beat your own score. It is easy to know when you do that since the program keeps track of your pairs, straights, etc. Very nicely done!

Being unfamiliar with Cribbage and Klondike, and having had enough play with this program to see it is a winner anyway, I decided to give the Sanyo a little rest at this point.

Summary

MichTron's Solitaire package is a real winner. At $34.95 list price, plus $3 shipping, it costs more than Newpoker (not that a comparison is necessarily in order), but it has more programs. It has terrific graphics, enjoyable games, and mental stimulation to allow you to keep going back. I recommend the program, and that you contact MichTron for a copy of its latest catalog (free). For those of you not yet familiar with this company, it is the largest supplier of Sanyo 550 series computer software. Write to: MichTron, 576 South Telegraph, Pontiac, MI 48053. ●

New Dial-Back Computer Security Device

C.H. Systems, announces a second generation computer security device.

The new product, SuperSleuth, expands on the capabilities of their previous product, Sleuth by not requiring an external modem. SuperSleuth is equipped with a 300/1200 baud modem that is fully Hayes compatible. Also new is an optional Audit-Trail feature which gives systems operators a complete log of computer accesses and attempted accesses through the dial-up ports. This feature was available at the end of 1985.

Unlike a conventional modem, SuperSleuth requires all would-be users to enter a name and password. Upon receiving this information, SuperSleuth disconnects the line from the caller and varifies user authorization. If the caller is authorized, SuperSleuth will initiate a call-back sequence of the user's pre-programmed telephone number, thereby estab-

continued on page 188

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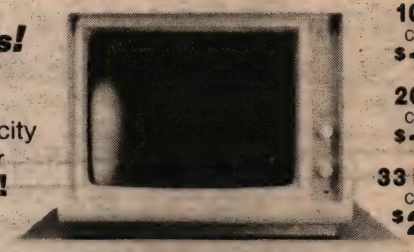
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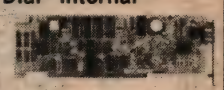
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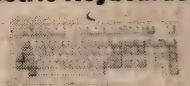
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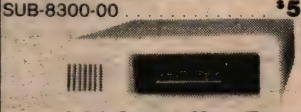
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New Ribbon Re-Inker For Apple Imagewriters

Bede Tech, Inc. has introduced a new motorized Ribbon Re-Inker designed especially for the Apple Imagewriter I and II ribbons. It will also support a variety of popular ribbon cartridge models.

Bede Tech's Re-Inker was specifically designed for the Apple Imagewriter I and Imagewriter II ribbon cartridge. The durable electric motor is covered by a one year limited warranty. The Bede Tech Re-Inker also re-inks ribbon cartridges for the C. Itoh 1550, 8510 Prowriter, Centronics 150/152, DEC LA 50/LASOR-06, NEC 8023A/Perscom, Scanset Miniprinter, Telex 281b *100938, and Toshiba P1010.

Bede claims that no upper limit has been set for the number of times a nylon ribbon can be re-inked. Re-ink ribbons regularly and store freshly-inked ribbons in air-tight plastic bags. Nylon ribbons are durable fabrics that can be inked again and again.



They fray and wear out only when they dry out. A frayed ribbon should be discarded because it can damage the printer-head pins.

Re-inked ribbons won't wear out from repeated hits by the high impact printer head. The surface area of a ribbon struck by a high speed impact printer is very small compared to the total surface area of the ribbon. The nylon ribbon is installed in the cartridge with a single twist that creates a Mobius Strip, which alternates the impact from one side to the other and from top to bottom. The nylon fabric has a long time to recover from the impact point as it winds its way around the spool. Ink will migrate back into the area hit by the pin unless the ribbon is too dry. Then the print quality deteriorates, and the dry ribbon can be damaged by the pins' impact. A freshly re-inked nylon ribbon retains its suppleness over an extended lifetime.

Typically, a ribbon requires one trip around the inking element. Depending on its length, a ribbon takes between seven and 15 minutes to re-ink. People who re-ink many ribbons will appreciate the optional electric timer available from Bede Tech that automatically shuts off the Bede Re-Inker after a pre-set time. Occasional re-inkers will not find a timer necessary.

It doesn't take much ink to re-ink a ribbon. Usually four to eight drops of ink will be sufficient. It depends on the length and dryness of the ribbon and how much ink is left in the Re-Inker roller. For best results, don't use a freshly inked ribbon for 24 hours, so that the ink distributes evenly throughout the nylon fabric.

If the ribbon is over-inked, simply run the ribbon through the Re-Inker and pass the ribbon over a dry paper towel. Or simply let the ribbon air out for a few days.

Bede Tech's complete ink kits include a four ounce bottle of black ink, or two ounce bottle of colored ink, with a blank roller and vinyl locking roller cover. Bede Tech also supplies high quality blank or pre-inked nylon ribbon cartridges. Inked cartridges are available in black, brown, red, blue and yellow.

To obtain more information call 800-772-4536, in Ohio 216/631-4214. Or write Bede Tech, Inc., 8327 Clinton Road, Cleveland, Ohio 44144.

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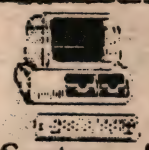
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Gato
continued from page 168

charging of the sub's batteries, oxygen remaining for breathing, Torpedos remaining (max of 24) and condition of the 4 torpedo tubes, what type of power currently being used (electric or diesel, damage indicator (you can call for a full damage report) and scope (up or down and direcion). The operator sets the speed and type of power to use as the conditions demand. Fuel or electric consumption is a function of speed. Direction and depth are set by the numeric keys.

Firing a torpedo involves opening the outer doors of the tubes and using the F8 key as a firing key. You must aim the torpedo and lead the target in order to successfully sink the target. The torpedo travels at 60 knots and will take some time to reach the target so its a little like shooting ducks. You have to shoot where the target will be, not where it is when you fire.

Navigation is fun. It requires that you keep track of several items at the same time. The RADAR screen shows the angle and range to islands and ships. The CHART of the patrol area displays current position and traces your path through the area. Enemy ships, islands and the subtender are also displayed. The QUADRANT shows the position within the actual chart quadrant. Shoals and reefs are shown in this mode (don't run aground!) and the qudrant changes as you progress through the patrol area.

Mission messages can be requested at any time. Normally this would be at the completion of a mission but you might decide to give up on a mission and start a new one at any time. The enemy may break the code used to send your messages and send false messages to confuse or trap you. Be careful, especially as the difficulty level is increased.

The subtender is used to repair damage, refuel and replace torpedos. Guess who sunk his subtender? Boy! What a dummy. No way to resupply.

The Captain's Log is the record for all the sub's missions of each ship sunk and total tonnage. The log is cumulative and does not clear when you reboot. It can be cleared by command if you desire. The game parameters can also be set by command when you desire. Difficulty Sound, Time of Day and Log are accessible through the TAB key. Be careful of the difficulty level! At levels above 7 the messages are in Morse only and if you can't read Morse, you get no messages!

There is a good section in the manual for GATO that covers strategic and tactical methods for "survival" and successful performance. This helps prepare you to make the proper decision during the game since

continued on page 172

Master Works — Integrated Programs For Apple II

Bridget Software Co. announced Master Works, a set of integrated programs for the Apple II computer consisting of a data base manager, a graph plotter and a word processor. The programs are as follows:

Record Master--a highly rated full-featured data base program offering arithmetic capability, global update, macro entry, mail labels, computed fields, file restructure, multi-level search and sort, and full report generation capability with automatic print breaks and totals. $60

Graph Master--plot bar, line, pie, and scatter (X-Y) graphs as well as user-inputted mathematical functions. Reduce up to 400 data points. Totals or averages, actuals or cumulatives, stacking, overlays, disk save, and much more. $35

Letter Master--easy to use, line-oriented word processor. Change, insert, delete text. Converts your computer into a smart electronic typewriter with macro entry, printer control, form letters, disk save, multiple print, and more. $20

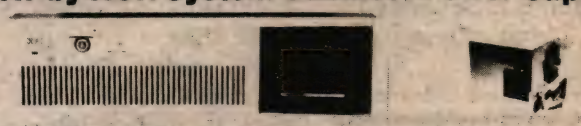
Separately, each program provides a powerful productivity tool. Together, they are a superb combination with file-interchange capability. The set of three programs is being offered for $75, a $40 savings. Free information is available.

For additional information contact Bridget Software Co., 1309 Canyon Rd., Silver Spring, MD 20904; (301) 384-7875.

Mention that you read about it in *Computer Shopper*. ●

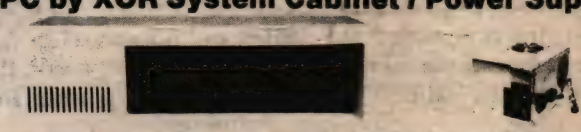
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CAB-9068-00 ..... $145.00
A perfect match to the **XAT** cabinet, this 200 watt switching power supply is equipped with four DC power connections to hook-up all those peripherals. One year warranty.
POW-1050-00 ..... $180.00

XPC by XOR System Cabinet / Power Supply



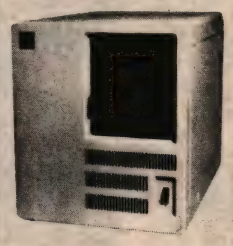
Our already famous **XPC-XT** cabinet has an 8-slot back panel with additional cut-outs for two RS-232 I/O ports. Features mounting for up to four half height peripherals, standard slide-off-the-front top piece, solid, molded front bezel, and heavy gauge steel.
CAB-6068-00 ..... $75.00
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135 Watt POW-1040-00 ..... $89.00 150 watt POW-1044-00 ..... $115.00

XTjr. by XOR System Cabinet



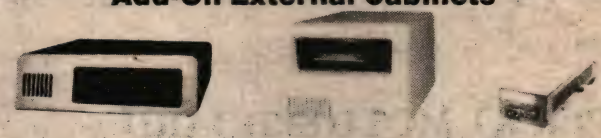
The **XTjr.** cabinet is only 3" x 16.5" x 15" yet it will hold a standard XT compatible motherboard. A special extender card BOA-5068-00 is used in the 5th slot to allow up to four add-on boards mounted horizontally in the cabinet. Two additional cut-outs are supplied for serial I/O. The cabinet price includes a switching power supply. Front panel cut-out for a half-height floppy or hard disk. AC switch and AC outlet for monitor on the rear panel.
CAB-5068-00 w/P.S. $135.00

XTC by XOR System Cabinet / Power Supply



The **XTC** cabinet is perfect for industrial and in an enginnering environment. Hinged door panels on both sides (removeable) allow easy access to components within. Also, a perfect system cabinet for the system integrator wanting to get away from the standard PC look. Front mount AC switch, cut-outs for three half-height peripherals and mounting behind the panel for a full-height hard disk or 1 or 2 half-height hard disks. Will accept mounting of the **XT**, **XTURBO**, and **XBC** motherboards 8-slot rear panel with two additional cutouts for serial I/O.
CAB-7068-00 assembled $99.00
Matching power supply; the switching power supply is a 135 watt unit that mounts in the top rear of the **XTC** cabinet for added cooling capability. Includes four DC power connectors for peripherals. 110/220 VAC, 50/60 Hz.
POW-1045-00 ..... $95.00

Add-On External Cabinets



Add-on a floppy, tape back-up, or up to 33 meg of hard disk (half-height). The rear panel has a universal AC input outlet, AC switch, and an automatic 110/220 VAC 50/60 Hz switch for easy configuration. Four cut-outs for ribbon cables are also provided. Switching power supply is included with cabinet and comes pre-installed and tested. Color: Grey beige, DC outputs: +5v @ 5.0 amps, +12v @ 1.5 amps.
This unit features a heavy duty linear power supply that has enough power to drive most any hard disk/tape back-up combo. +5v @ 5 amps, +12v @ 2.5 amps, and 110/220 VAC-50/60 Hz
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Dual Half-Height Cabinet



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Timex Sinclair
continued from page 77

will keep the volume steady rather than dropping to nothing after a cycle is through; adding 2 will cause the build/fade cycle to reverse; adding 8 will cause the tone to continue instead of stopping after a single cycle.

Remember that even though the envelope is controlling the volume, you still have complete control over the pitch and can change it as you would normally.

The final use of the T/S 2068's SOUND command is the production of special affect sounds. This is done by enabling a channel for noise instead of tones. This is done in the same manner as enabling a channel for a tone - that is by subtracting a value from register 7's initial value of 63. In this case, you would subtract 8 for channel A; 16 for channel B; or 32 for channel C. When you enable a channel (or channels) for noise, you will use the final SOUND register - 6. Register 6 can hold values in the range of 0 to 31. The higher the number loaded into this register, the lower the pitch of the noise you produce. By combining noise and envelope control, you can create almost any type of sound effect your imagination can produce.

The Timex manual has some, and you can find more in BASICS AND BEYOND.

For a more detailed explanation of the SOUND command on the T/S 2068, and many additional examples and ideas for its use, I highly recommend T/S 2068 Basics and Beyond by Sharon Zardetto Aker (Scott, Foresman and Company).

Those of you who have Rotronics wafadrive connected to your T/S 2068 (or Spectrum for that matter) can contact TS Services for their latest catalog. They have been obtaining the rights to many of the most popular programs for the purpose of modifying them to run on the wafadrive. For your copy of the catalog and information about the National TS Users Group, write to TS Services; P.O. Box 15214; Red Bank, TN 37415; (615) 877-6328. Mention that you heard about it in *Computer Shopper*.

Next month a hands-on review of the Sinclair QL. ●

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Preparation For The SAT

by Lon Andrews

Some people are telling us that the Scholastic Aptitude Test (SAT) scores are not important any more when it comes to getting accepted to college. So far I haven't seen any actual data to support this claim but I still see the colleges requiring a certain score on the SAT for entry. The SAT remains a hurdle to be dealt with by the aspiring college freshman.

Review for these tests can be a most trying effort due to the vast amount of material to be covered. We have seen several preparation classes start up in order to help the student improve his/her SAT scores.

When it comes to this type of learning the computer really shines. It has all the time in the world and the patience of a granite wall. It never loses its temper and almost never raises its voice to a student. Enter *Lovejoy's Preparation For The SAT* published by the Compuer Software Division of Simon & Schuster for IBM and compatibles.

Before looking at the actual program the documentation deserves some attention. This is a most attractive package. The documentation covers a lot more than a computer program. Included is *Lovejoy's Concise College Guide* that gives up-to-date information concerning tuition, room and board, and SAT scores for 350 U.S. colleges and universities. Also included is information about how to apply to a college, where to look for scholarships and how to select a college that suits your needs. All of this is a small paperback found in the package. The rest of the documentation deals with the SAT directly.

The first section covers how to apply to take the SAT, what is contained in the test and general information concerning scoring, reporting, test length, how often to take it and more. The second section deals with diskette care and program operation. The 3rd, 4th, 5th and 6th sections deal with using the program as a study aid for the SAT. One of the most helpful parts is the one on special strategies for test taking that helps prepare the student for particular skills in the SAT or any test for that matter. The balance of the text deals with various subjects that will help you increase your scores.

The documentation is wire bound, about 6" x 9" and in an attractive hard binder. It is very well written and easily understood by students of the level that will be taking the SAT.

The program itself is pretty much self explanatory. Very well written and thought out, it matches the quality of the documentation. It is not copy protected so make backups as soon as you unwrap the disks. Pre-printed disk labels are supplied for each disk you backup. This is a nice touch on someone's part at Simon & Schuster. By the way, thank you S & S for not copy protecting this program. You will have a program disk, an exam disk and a scoring disk.

The program and exam disks are not bootable. Use a DOS disk to boot up and then go to the program or exam disk. The programs are called up by either "EXAM" or "PRACTICE" depending on which disk you are using. Directions and/or prompts are given that will lead you through the program. Directions do not need to be memorized as all available options are shown at any given point in the program.

Answers are automatically graded by the program. Reviewing a section will show your answer highlighted and the correct answer appears in a window. Each time the exam is called up the scoring history is presented. For this reason you must use the same scoring disk each time. You are given a choice of exams 1 or 2 when you elect to take an exam. The exam may be taken in any order but you must complete the entire exam before you can start over. The methods of preparation for the SAT using the Lovejoy program involves practice sessions and actual exams.

Taking the exam is like falling off a log...easy. All you need to supply is the answer by selecting either A,B,C,D or E. Once the answer is selected it is highlighted on the screen. It is no problem to change an answer or leave it blank and go on. The program keeps time for you and signals when 5 minutes remains and again at 1 minute. When time is up the keyboard becomes inoperable and the section is automatically scored.

When necessary the program provides a scratch pad to

continued on page 174

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Gato
continued from page 171

many of them are not cut and dried situations but involve the element of risk (and luck). Characteristics of the enemy vessels are given so you have a better idea of what to expect.

The documentation is in the form of a small (5½ x 8) manual that is very well written and easily understood. Spectrum Holobyte has obviously done their homework in preparing the docs and the program. Take time to read the manual before using the GATO program. It makes it much more enjoyable.

The program can be backed up but requires the master disk at the beginning of the program to read the identification if you are running on floppy disks. After this is done you can run from the backup. If the master disk is lost or destroyed you cannot run the program. The Master can be replaced by returning the original disk and $7.50 to Spectrum Holobyte, Inc. GATO can be installed on your hard drive and run without the master disk.

I enjoyed this simulation from the start. The neighbors are getting tired of hearing me holler "DIVE! DIVE! DIVE!" but, other than some lost sleep, that is the only negative reaction. It is not something that you master in one try. It is somewhat like driving a car, you get better with practice until you are doing some skills almost "sub"consciously. Be prepared to spend several hours learning the ins and outs of being a submarine commander.

There is a section of the program that gives you the history of these submarines. This is an excellent addition to the program by Spectrum Holobyte. The names used in the program for various vessels are actual names of craft used during the war.

GATO runs without a hitch and is without a doubt one of the best programs of its sort I have run across. If you are interested in simulations that will test your abilities you will enjoy GATO as much as I have. You can't go wrong with this package!

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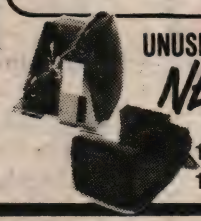


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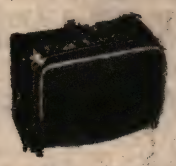
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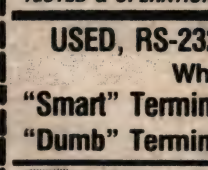


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"(C)" As An Invalid Notice Of Copyright

by L.J. Kutten

I have finally concluded that some group is masterminding a conspiracy to destroy software companies by ensuring that their programs enter the public domain. My evidence is that within the past five months alone, I have received nine software packages with potentially defective copyright notices.

Under the 1976 Copyright Act, 17 U.S.C. §§ 101 et. seq., a valid copyright notice does not have to be placed on the work before it enters the marketplace to prevent it from entering the public domain. But, if no notice or improper notice is given, the work eventually enters the public domain unless the defective notice is cured as provided by statute.

Under the law, valid notice consists of three elements:

1. The symbol "©" (the letter C in a circle), or the word "Copyright" or the abbreviation "Copr."; and
2. The year of first publication (i.e. the year of first public distribution); and
3. The name of the owner (not the author) of the copyright in the work.

Unfortunately far too many companies and authors fail to use the statutorily required symbol "©," or the word "Copyright," or the abbreviation "Copr." Instead variations such as "(C)" or "[C]" are used.

According to the Copyright Office, misspelled or variant forms of "Copyright" or "Copr." will be accepted if it is clear that copyright is meant. A variant of the symbol © is acceptable only where it resembles the © closely

continued on page 177

Apple II Pascal Software To Support Undisk 3.5 Disk Drive

Apple Computer, Inc. has introduced a new version of Apple® II Pascal (version 1.3) that supports UniDisk™ 3.5, Apple's recently-introduced 3½-inch floppy disk drive that increases floppy disk storage capacity for Apple II users to 800 kilobytes. Apple II Pascal is Apple's version of the popular Pascal programming language for Apple II computer users who require an advanced Pascal development environment.

Apple II Pascal, version 1.3 allows users to format a 3½-inch disk from within the Pascal operating system and create larger programs without having to access multiple disks. It includes the language on both 3½-inch and 5¼-inch disk formats, allowing customers to choose the format they want to use. The 3½-inch version of the software fits on a single diskette; the 5¼-inch version still requires four separate diskettes to store the entire Pascal system.

The new Apple II Pascal also comes with a 950-page manual that consolidates all of the information previously contained in several different volumes. This new manual allows users to find specific information more quickly and easily.

Apple II Pascal is a complete software development and operating system, providing text editing facilities, utility programs and a complete Pascal and Assembly language development environment. The new version of Apple II Pascal runs on any Apple II Plus, IIe or IIc personal computer with at least 64 kilobytes of internal memory.

Apple II software developers use Apple II Pascal more than any other development system. In addition, it is used in secondary schools to teach computer programming skills and prepare students for college-level examinations that require the ability to program in Pascal.

Upgrade Program

Until May 31, 1986, existing Apple II Pascal users can upgrade their software to version 1.3 by sending their original Apple II Pascal disk (labeled APPLE1) and $125 to: Apple Computer Pascal 1.3 Upgrade, PO Box 306, Half Moon Bay, CA 94019.

Customers who upgrade to the new version will receive Apple II Pascal on both a single 3½-inch disk and on four 5¼-inch disks, along with the new manual.

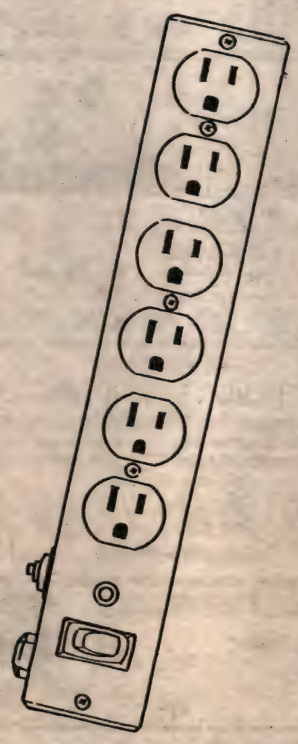
Price and Availability

Apple II Pascal, version 1.3 is available now from authorized Apple dealers worldwide, and has a U.S. suggested retail price of $250, the same suggested price for which earlier versions of Apple II Pascal sold. ●

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Prep for SAT
continued from page 172

do work on, a calculator to assist with math and the ability to highlight passages of reading to remind yourself of its importance. In order to use the GRAPH option or to go to the REVIEW you must exit the program by using CTRL-BREAK.

By using your scores as a guide you can select which sections of the SAT you need to spend more time studying. 0 to 40% means that you are doing poorly in a particular section and need to study the material. 41 to 59% Not so hot! Review the missed questions and see why you missed them. Review the strategies presented in the text 60 to 70% Not bad! See if you missed the questions or left them blank. Do mental calculations when possible instead of manual to save time. Re-read shortcuts and tips in the text. 80 to 90% Wow! Review missed questions. Check to see where you had to guess. 100% The best score that anyone can get on a section. Make sure answers were a result of knowledge and not lucky guesses.

The recommended procedure for use of this program is to take one exam as a pre-test. Review the sections and look at the summary screen to find individual weaknesses. Do the practice topics in areas where you are weak and review each section's explanations. Finally take the second exam as if it were a real SAT. Do all 5 sections in one sitting. Use the GRAPH option to compare your results. Study the Special Strategies section right before you take the real SAT.

It has been my experience that most students benefit a great deal from repeating the SAT as often as possible before they apply to a school. Some schools only use the latest scores while others average the scores from each time the test was taken. Several schools do not count scores achieved before June at the end of the junior year. Check with individual schools to see how they handle the SAT scores. Don't guess! It's too important.

A call to the 800 number for technical support produced a referral to (201) 592-2900. Here I was advised that they could not guarantee that the program would run on any compatible but would support the IBM and Apple family as well as the Commodore 64.

If you have a sophomore or junior at home and a computer that will run this program it is definitely worth the price of the program to provide the review for your son/daughter. What you might save could by far outweigh the $69.95. Since the program uses a separate scoring disk it can be used for any number of students simply by changing the scoring disk as needed.

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BSE - Microsoft's Hidden Word Processor

by Curtis F. Franklin, Jr.

There are people who like to find tools to do a job, then stick with those tools 'till death do them part. Others are always searching for the latest widget or the perfect potato peeler. I'm afraid that I am a word processor junkie. Never daunted by the fearsome "learning curve," I have worked on nearly a dozen different systems, and I still go on looking for new packages with neat features that will start my juices flowing and my fingers tapping. You can imagine my joy when I recently discovered a WP package that I hadn't paid for and didn't even know I owned. No, this is not a shocking confession to software piracy, but a discovery of a package that most H/Z programmers own but have probably never used for word processing.

Almost all serious programmers will, at one point or another, turn to assemmbler to solve a problem. The assembler most turned to in the MS-DOS world is MASM, from Microsoft. When MASM is purchased from Zenith, it comes as part of the "Programmer's Utility Pack" along with a number of utilities. Included in the pack is BSE, an editor. Most programmers will simply view this as a welcomed alternative to EDLIN, but while reading through the documentation I found the key to my current excitement: BSE has a "word processing mode!" I was pleased to find this but I wondered just how good a word processor based on a program editor could be. I found that the answer depends in large part on your needs.

If you are a fan of nearly transparent editors, BSE will win points almost immediately. A 25th line status report is all that reminds that a program is running. This line gives you the file being edited, current line, current column, and stack and buffer information. If you're used to a Wordstar screen, the lack of comforting clutter at the top of the screen can be almost frightening.

Commands are executed using Wordstar-like logic. There are numerous two- and three-keystroke combinations, but the commands are not Wordstar commands. Function keys are used primarily for file and buffer manipulation. The main difference between the program on the Z-100 and on the Z-100 PC is that the additional function and special-purpose keys on the Z-100 are used to replace control sequences used on the Z-100.

BSE has nothing so fancy as windows, but it does have buffers that can hold entire files or portions of files. Editing can be transferred from buffer to buffer, and blocks of text are easily moved between buffers. BSE can keep track of up to 255 buffers at a given time. Since this is several more than I can keep up with, I never ran into a problem with this feature. These buffers make moving text between files, or between widely separated sections of a large file, much easier in BSE than in many professional word processors.

One of the most comforting features of BSE is its willingness to give you a second chance. There is nothing I know that quite matches the feeling when you accidentally delete three paragraphs of your prize manuscript. In Wordstar you cry. In BSE, you pop the

continued on page 176

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BSE Word Processor continued from page 175

missing lines of the salvage stack. BSE stores up to 128 lines on its salvage stack. Unless you're in the habit of deleting a chapter at a time, this will keep you out of most serious trouble. This feature alone would sell this program to a lot of people I know.

BSE has on-line help facilities, but don't expect an instant tutorial. The help screens list keystroke combinations and what they do. The screens do not show you how to use the commands or why you might want to use them. The Zenith manual is superb so long as you don't need any examples. This is a typical technical manual, with brief command descriptions and nary an example. Heath has always produced good manuals for experimenters and this is no exception. If you're not afraid to experiment with your WP commands, this approach will give you in-depth knowledge of useful (and disastrous) features.

When it comes time to print your text, BSE won't get in your way. It doesn't waste your time asking about lots of options. It prints files in a very simple, straightforward fashion. If you need nothing more sophisticated than underlining and boldfacing, then you're in business. I found myself missing automatic centering and variable line spacing. If you want to submit a double-spaced manuscript, you'll become good friends with your RETURN key.

Finally to the bottom line: Have I found my ultimate word processor? No, in fact this column was written using Wordstar. I like the degree of transparency, and I love the salvage stack, but I've grown far too accustomed to the print control and line spacing features of my regular system. I would hesitate to recommend BSE to a non-technical novice, but if you're a programmer who needs solid, basic word processing, by all means reach into your utility pack and try this little editor before you shell out for an expensive word processing system. ●

Apple Computer Offers Schools Trade-In Program

Apple Computer, Inc. has unveiled a program that lets U.S. schools upgrade the investments they've made in personal computers with up-to-date computer technology. The program gives schools nationwide the opportunity to trade in used computer systems on a one-for-one basis for credit toward the purchase of new Apple II or Macintosh personal computers.

From March 15, 1986 through December 31, 1986, schools can trade in Apple II, Apple II Plus, Apple III, PCjr, Tandy II, III and IV, and selected Commodore computer systems--which include a monitor, CPU and disk drive--as well as additional disk drives, selected IBM typewriters, and selected computer systems from other manufacturers. For each returned system, the school will receive credit toward the purchase of an Apple computer system. Depending upon the make and model, credits on trade-ins can run up to $200 for each system. To take advantage of the program, schools must order a minimum of five new Apple computers through Apple's Education Purchase Program.

"We recognize the need for schools to upgrade the quality and the functionality of their computers," said Jim Buckley, Apple's education channel manager. "Schools are making major, long-term investments in computer equipment and those investments must be protected. Apple intends to provide schools with that kind of security. We've made a long-term commitment to helping schools integrate computers into the clasroom. One component of that commitment is to provide the kind of sales that enable schools to take advantage of changing computer technology at an affordable cost. This program also increases the opportunities for Apple's authorized education dealers."

The returned sytems will be refurbished and sold as used equipment. Apple has reached an agreement in principle to sell the equipment through an independent representative--the Microcomputer Inventory Exchange, a Santa Barbara-based firm specializing in remarketing refurbished equpment. To ensure that the program doesn't impact sales of new equipment by Apple's authorized dealer base, Apple's special market group is identifying non-competitive markets and Apple will retain the right to refuse any sale. Prices will be based on *The Brown Book*, an industry guide that establishes prices for used computers.

For further information contact Apple Computer, Inc., 20525 Mariani Avenue, Cupertino, CA 95014; (408) 996-1010.

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Checks & Balances:
Finance System for Both CP/M and MS/DOS

by Ken Fermoyle

Books are wonderful things and I keep lots of them around — to read. *Keeping* books, as in entering lots of numbers into little squares, is something else again! I don't think I'm alone in not being especially fond of keeping tabs on the family finances.

When we got a computer I hoped it would help do that job better than I'd been able to do in the past. What a break that would be each April 15! Especially in the Fermoyle household. My wife is an insurance consultant to business management firms while I do freelance writing and newsletter publishing in addition to my "regular" job as a writer/editor at Hughes Aircraft. So we need to keep rather extensive records for tax purposes.

It turned out that finding the right software to do the job for us wasn't as easy as I expected. The low-end "home finance" programs we checked were too limited, too slow, too complicated, or all of the above. The full-scale professional accounting systems offered general ledgers, accounts receivable and all the rest of that expensive stuff we really didn't need.

Several friends rigged up spreadsheet programs to do a certain amount of personal bookkeeping but that seemed to be a lot of work for the results offered.

Then we discovered Checks and Balances. It's a single-entry system that claimed to be "ideal for the home or business run out of checkbooks." It could handle monthly budgeting for up to 64 categories, unlimited categories for taxes, and reports for income or expenses, according to further claims. All this for $74.95. It would even print checks and maintain a rolodex-like file of names and addresses that could be searched, sorted and cross-referenced or looked up in a variety of ways.

Sounded too good to be true, but worth a try. And it turned out to be an excellent choice. Checks & Balances did everything claimed for it and lots more, too. (We first got Version 3.1 and have moved up from V. 3.3 to V 3.6, finding that each update has had very worthwhile improvements.)

And it works all these wonders in either C/PM or MS-DOS! That is terrific news for the two million or so users of 8-bit machines like my Epson QX-10 (though I have bowed to the PC wave by installing a Titan QXPCII co-processor board with 256K of RAM so I can run many MS-DOS programs).

Another thing I like especially is that C&B allows you to add and change entries on the screen just by moving the cursor, offering full on-screen editing options similar to those found in word processors. As the manual blurb puts it: "If it's on the screen, you should be able to change it."

You can't appreciate that kind of versatility completely unless you've struggled with some of the balky, cumbersome methods required to change entries in other bookkeeping systems. There are other pluses, too.

Any transaction (check, deposit or other) can be split into up to four categories; a mortgage payment entry, for example, could show the principal and interest amounts, as well as the total. This is *really* handy when it comes time to figure income tax deductions. Or suppose you write out a check for $200 to your friendly computer store. Suppose further that $110 of that is for tax-deductible supplies and the other $90 is for games or something similar for personal use. The entry could be broken down and keyed to show the gross, personal expense and deductible amount, with explanatory memos detailing the items. (This procedure is covered in detail in the User Manual.)

This business of explanatory memos is another area where C&B really shines, by the way. The program provides for up to 39 characters for payee identification in check entries. Some other personal finance programs allow only 15 characters. C&B also gives you a 45-character memo field for entries. Dollars & Sense has no memo field, while others restrict you to 15 characters. To me, this is a major asset.

Instead of having to decipher "CompSupDsksetc" or something like that, I can simply read: "Computer Supplies, 10 disks, box paper, ribbon." The less cryptic memos sure make it simpler to prepare expense accounts reports, to prepare tax information or simply to refer back to an item for any reason. Maybe you just want to find out how long that box of computer paper mentioned above lasted.

C&B handles multiple checkbooks, and has search and printing flexibility that locates records by date, check number, category, or by entries you've made in PAY TO or MEMO fields. It keeps track of bills, displays up to seven checkbook-like entries on the screen at once. Best of all, it uses plain, easy-to-understand English commands to perform all these chores.

To check a budget, for example, you simply type the command "BUDGET." Type "SHOW 104" and full information about check #104 appears on the screen. You can print whatever is displayed on the screen at any time by hitting the "print screen" key (normally control-P for CP/M

continued on page 178

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Invalid Notice
continued from page 174

enough to indicate clearly that the copyright symbol is meant. According to the Copyright Office, acceptable variations include "(c", "c)", and "(C)".

Unacceptable variations include "CO", "C", "C/O", "[C]", and "[C]".

The trouble with this approach is that the Copyright Office has no legal right to accept anything other than the statutory requirements. In a response to specific questions regarding the use of "(C)" it stated it had no authority to change the law:

"The Copyright Office has no authority to alter [the statutory] requirement... [A]lthough the print matrices may not presently be equipped to print the symbol ©, they can presumably print either of the alternative indicia."

The danger of using anything other than the statutory notice is that it gives a judge discretion to rule proper notice was not given. Consider the following scenario:

1. Plaintiff having used "(C)" as part of his copyright notice sues for infringement.

2. Defendant replies saying notice was not given because the exact requirements of the Copyright Act were not met.

3. The judge rules that substantial compliance with the Copyright Act is not enough when the statute explicity states the form of the notice.

4. The work now enters of the public domain.

How likely is a court to state that substantial compliance is not enough. An answer may be found in Higgins v. Keuffel, 140 U.S. 428 (1891). There the United States Supreme Court held that failing to follow the exact requirements of the Copyright Statute meant that a claim for copyright could not be brought:

> "The copyright is secured when the registration is complete, and a certificate of registration is given by the commissioner;...But in this case notice of the copyright obtained has not been given as required. The law in that respect has not been followed. The fact of registration alone is placed upon the label. The word 'copyright' is not used, and, of course, with its omission the essential facts respecting any copyright are omitted also. The law, therefore, has not been complied with, and by its very terms no action can be maintained for the infringement of the alleged copyright without such compliance." Id., 434.

Why all software companies do not follow the exact requirements of the law in something so important as protecting their most valuable asset is beyond me. Given the clamor over the past few years regarding software copyrights, one would assume they would do whatever is necessary to protect their rights. ●

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REPS-TERRITORIES AVAILABLE

Checks & Balances continued from page 177

and F7 for MS-DOS systems. Another nice touch: a line at the bottom of the screen *always* shows your true balance (including non-check book entries of income and cash outgo, as long as you've recorded them in C&B). It also shows your bank balance, though that may be a mixed blessing at times.

C&B offers a surprising number of advanced features, too. You can do accounts receivable, manage savings accounts and liabilities (credit card expenditures and loans), keep track of mileage and travel expenses. The "rolodex" feature not only allows sorting and searching of name and address files, but can be used for printing mailing labels, rolodex file cards or 3x5-inch file cards.

C&B is written in Assembly and compiled PL/I languages, so it's fast. Anyone who has tried some of the other painfully slow personal finance or home accounting programs will be delighted at the rapid computations and screen display changes C&B provides.

It's also command driven, with no linked menus, which adds to its speed. There's no need to plod backward and forward through a series of menus to do any given task.

But don't let the lack of menus scare you off; C&B's creator, Pat Lajko, has made the program "user friendly" without them. He's provided a list of commands and their meanings that is always available from the command line, Line 24 on the screen. To go from the command line to the data area (or vice versa), you just press TAB or ESCAPE. The cursor moves to Line 24. Entering a return automatically brings up the list of commands in the command summary.

HELP screens also are always available (unless you have a C/PM machine without adequate disk space to accommodate the entire C&B package). Typing HELP alone at the command line brings up a general HELP menu. Typing HELP plus a function (HELP SUM, HELP BILLS etc.) brings up a HELP screen with information on that particular function.

The original User's Guide packed a lot of information into its 48 pages, but the 170-plus-page manual packaged with the newest version is much more detailed. It is still remarkably free of the technoid computerese beloved by so many software user/reference manual authors. This one you can understand without a degree in computer science! It defines "Terms You Need to Know" in a brief glossary immediately after the introduction. More important, it includes many, many illustrative figures; most are actual replicas of screen displays that do a good job of helping you understand the accompanying text.

There is no index but the table of contents is so detailed that this isn't a serious lack.

Checks & Balances does have certain minimum requirements. For CP/M systems these include: Z-80 processor, terminal with addressable cursor, 56K RAM minimum, 2 or more disk drives with 160K bytes or more per drive, and CP/M 2.2. For MS-DOS systems, requirements are two disk drive, MS-DOS or PC-DOS operating system and 256K RAM minimum.

There are few basic no-no's. You can do pretty much what you like at any time. If C&B doesn't want you to do it, it either will tell you or "quietly ignore you ... and don't you wish every program was that polite?" comments the manual. You *must* always use the "Bye" command to quit C&B. This ensures that all files are properly updated and closed. Quitting by simply re-booting your system won't do that.

If you've never tried any kind of personal accounting program before, C&B may seem just a bit confusing at first. I suggest that you read through the first pages of the manual quickly and use the DEMO file provided to get acquainted with basic commands. Then jump right in and start setting up your check book. If you get stumped, check the manual's contents pages and/or use the Help function to get assistance. All will become clear very quickly.

The program admittedly isn't the answer for professional bookkeepers or accountants. It *will* serve very nicely for those of us who want something geared to the personal finance and sideline business user. And you'll find it includes some practical features that some pro systems can't match.

Checks & Balances is produced by CDE Software, 948 Tularosa Drive, Los Angeles, CA 90026, (213) 661-2031. ●



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Toward The Ultimate continued from page 74

3. see any drive Directory.

If you are interchanging with other types of terminal software, especially CP/M, be sure they use XMODEM (Error Checking) Protocol. Some use additional CRC checking and this may or may not work. The program works well with the Modem 730 program included with Montezuma Micro CP/M.

Mod's and Conversions

If you own a Model I you could adapt this program by changing DOSPLUS 3.5 calls. If you are using some other DOS such as TRSDOS you will have to do some major rebuilding and probably leave out the Directory feature. I've used the DOSPLUS series since the Model I and now with 3.5 for the Model III I have complete compatibility with Model 4 TRSDOS 6.x and DOSPLUS IV. I stayed away from TRSDOS 1.3 entirely, even in patched forms. Since its Directory structure is completely different, nothing will read its files!

This program could be written in true Model 4 structure with SVC's but the only advantages would be an 80 character screen, Inverse Video, and sound "beeps" which many would call "just Bells & Whistles." The doubled speed of the 4 wouldn't really offer much in a communications program. While TERMINAL/CMD isn't the most fancy communications program around, it does a good, simple job of giving you error free file transfers. That's got to be your first step if you really want to start getting some good from CP/M by "Crossingover" useable Model 4 Programs. If Networking is going to be useful in the hobby, we need to get some universal transfer methods started. ●

Toward The Ultimate — Program continued from page 73

```
00010 ;************************************
00020 ;... TERMINAL/CMD     FOR MODEL IV
00030 ;                (Model III Mode)
00040 ;                  DOSPLUS 3.5
00050 ;          USES XMODEM Protocol
00060 ;  for ASCII or BINARY (CMD) Files
00070 ;  (or 'HEX' converted CP/M Files)
00080 ;       RKF   VER 1.0   July/1985.
00090 ;
00100 ;************************************
00110 ;
00120 MASK    EQU     0EFH            ;RS-232 Settings
00130 BAUD    EQU     55H             ;Baud Rate = 300
00140 CLS     EQU     01C9H           ; ... ROM Calls ...
00150 KEYBRD  EQU     002BH           ; .    "
00160 KEYWT   EQU     0049H           ; . .    "
00170 LININ   EQU     0040H           ; . . .    "
00180 SCROLL  EQU     4214H           ;Lines to Scroll protect
00190 DSPLY   EQU     0033H           ; . . . .
00200 CHKSPC  EQU     441CH           ;DOSPLUS Check Filespec
00210 OPEN    EQU     4424H           ; ... Disk Calls ...
00220 INIT    EQU     4420H
00230 CLOSE   EQU     4428H
00240 READ    EQU     4436H
00250 WRITE   EQU     4439H
00260 CAT     EQU     4419H           ;DOSPLUS Show a Directory
00270 ;
00280         ORG     6000H
00290 START   LD      SP,5FFFH
00300         CALL    INITAL
00310 ;
00320         CALL    PRMPT
00330 ;              MainLine Loop
00340 ;*****************************************
00350 LOOP    CALL    SCAN            ;Key Down?
00360         JR      Z,LOOP2         ;No
00370         CP      6               ;Is it <CTRL> F
00380         JP      Z,FILE
00390         CALL    SENDIT          ;no,  then send it
00400         JR      LOOP3
00410 LOOP2   IN      A,(0EAH)        ;Check Modem
00420         AND     80H             ;anything in?
00430         JR      Z,LOOP          ;no, start over
00440         IN      A,(0EBH)        ;get Char. from Modem
00450 LOOP3   CALL    SCRPRN          ;show key or input on Screen
00460         JR      LOOP            ;repeat the loop
00470 ;*****************************************
00480 ;              Subroutines follow:
00490 INITAL  XOR     A               ;Initialize RS-232 Board
00500         OUT     (0E8H),A
00510         LD      A,MASK
00520         OUT     (0EAH),A
00530         LD      A,BAUD          ;Buad Rate = 300
00540         OUT     (0E9H),A
00550         RET
00560 SCAN    CALL    KEYBRD          ;Check Keyboard
00570         OR      A
00580         RET     Z               ;Nothing down
00590         CP      18H             ;<CTRL> X?
00600         JP      Z,402DH         ;Quit to DOS
00610         CP      1FH             ;<CLEAR> KEY?
00620         CALL    Z,PRMPT         ;Restart Terminal Mode
00630         RET
00640 PRMPT   XOR     A
00650         LD      (SCROLL),A
00660         CALL    CLS             ;CLS Entire Screen
00670         LD      A,4
00680         LD      (SCROLL),A      ;Protect top 4 lines
00690         LD      HL,MESS1
00700         CALL    SHOW            ;Show Main Menu
00710         LD      A,0EH           ;Cursor on
00720         CALL    DSPLY
00730         RET
00740 SHOW    LD      A,(HL)          ;Display a "Message"
00750         CP      24H             ; to the screen
00760         RET     Z
00770         AND     A               ; End with '$'
00780         RET     Z               ;  or a '0'
00790         CALL    SCRPRN
00800         INC     HL
00810         JR      SHOW
00820 SCRPRN  PUSH    HL              ;Show one Char. on Screen
00830         PUSH    DE
00840         PUSH    BC
00850         PUSH    AF
00860 SCR1    CP      0DH
00870         JR      Z,SCR2
00880         CP      9
00890         JR      Z,SCR2
00900         CP      8
00910         JR      Z,SCR2
00920         CP      0AH
00930         JR      Z,NOSHO         ;ignore LF
00940         CP      20H
00950         JR      C,NOSHO         ;ignore ctrls
00960         CP      80H             ;Above LC?
00970         JR      C,SCR2
00980         AND     7FH             ;Reduce graphic char by 128
00990         JR      SCR1
01000 SCR2    CALL    DSPLY
01010 NOSHO   POP     AF
01020         POP     BC
01030         POP     DE
01040         POP     HL
01050         RET
01060 SENDIT  PUSH    AF              ;Send Char. in (A) to Modem
01070 WAITS   IN      A,(0EAH)        ;XMitter Ready?
01080         AND     40H
01090         JR      Z,WAITS
01100         POP     AF
01110         OUT     (0EBH),A        ;send it
01120         RET
01130 ERROR   PUSH    HL              ;Disk Error Routine
01140         PUSH    DE              ;Save all Registers &
01150         PUSH    BC              ;Show DOS Error Message
01160         PUSH    AF
01170         LD      A,0DH
01180         CALL    DSPLY
01190         POP AF
01200         PUSH    AF              ;Save flags
01210         OR      0C0H
01220         CALL    4409H
01230         LD      A,'?'
01240         CALL    DSPLY
01250         CALL    KEYWT           ;& wait for any key
01260         POP     AF
01270         POP     BC
01280         POP     DE
01290         POP     HL
01300         RET
01310 FILESP  LD      HL,MESS3        ;Get in a File Name
01320         CALL    SHOW
01330         LD      B,25
01340         LD      HL,INPUT        ;setup Input Buffer
01350         PUSH    BC
01360         PUSH    HL
01370 FIL2    LD      (HL),0DH
01380         INC     HL
01390         DEC     B
01400         JR      NZ,FIL2
01410         POP     HL
01420         POP     BC
01430         CALL    LININ           ;use ROM input Routine
01440         JR      C,FILE          ;Restart it if BREAK pressed
01450         LD      DE,DCB
01460         LD      HL,INPUT
01470         CALL    CHKSPC          ;Set up filespec
01480         JR      NZ,REPEAT
01490         RET
01500 REPEAT  LD      A,1BH           ;error in input
01510         CALL    DSPLY
01520         LD      A,1EH           ;clear the line
01530         CALL    DSPLY           ;& show 'Filespec' again
01540         JR      FILESP
01550 ;
01560 FILE    XOR     A               ;CLS & Enter
01570         LD      (SCROLL),A      ;'FILE TRANSFER' Mode
01580         CALL    CLS
01590         LD      A,1
01600         LD      (SCROLL),A
01610         LD      HL,MESS2
01620         CALL    SHOW
01630 FILE2   CALL    KEYWT
01640         CP      31H             ;Get (1) Send
01650         JR      Z,SEND
01660         CP      32H             ;      (2) Receive
01670         JP      Z,RECEVE
01680         CP      33H             ;        (3) Directory
01690         JR      Z,CATLOG
01700         CP      18H             ; <CTRL> X ?
01710         JP      Z,START         ;Back to 'Terminal Mode'
01720         JR      FILE2
01730 CATLOG  CALL    CLS             ;Show a "Directory"
01740         LD      HL,MESS16
01750         CALL    SHOW
01760         CALL    KEYWT           ;Get Drive No.
01770         SUB     30H
01780         JR      C,CATLOG        ;Drive No. OK?
01790         PUSH    AF
01800         CALL    CLS
01810         POP     AF
01820         LD      C,A
01830         CALL    CAT             ;DOSPLUS Catalog Routine
01840         LD      A,0DH
01850         CALL    DSPLY
01860         LD      HL,MESS6
01870         CALL    SHOW
01880         CALL    KEYWT           ;Wait for a any Key
01890         JP      FILE            ;Back to Menu
01900 ;/////////////// Send a FILE Module ////////////////
01910 SEND    CALL    CLS
01920         CALL    FILESP          ;Get the Filename
01930         LD      DE,DCB          ;set up to Open File
01940         LD      HL,BLK
01950         LD      B,128           ;128-byte LRL
01960         CALL    OPEN            ;Open the file
01970         CALL    NZ,ERROR        ;Disk Error??
01980         JR      NZ,SEND
```

Program continued on page 182

MICRO WAREHOUSE

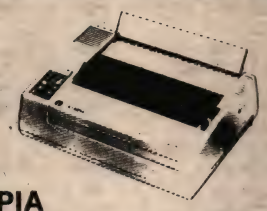
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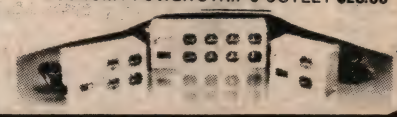
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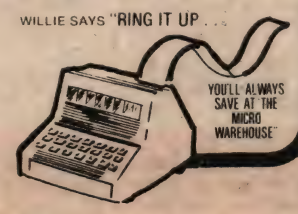
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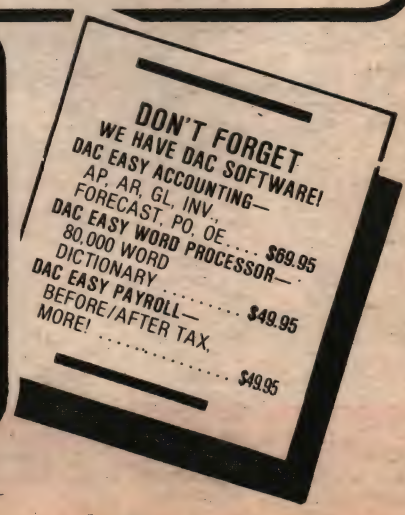
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Program continued from page 180

```
01990           LD      A,(DCB+9)       ;check LRL
02000           LD      (LRL),A         ;Save it
02010           CP      80H
02020           JR      Z,WAIT2         ;if LRL=128 OK
02030 NULRL     LD      HL,INPUT
02040           LD      DE,DCB          ;Reopen to LRL<>128
02050           PUSH    DE
02060           CALL    CHKSPC
02070           POP     DE
02080           LD      A,(LRL)
02090           LD      B,A
02100           LD      HL,BLK
02110           CALL    OPEN
02120           CALL    NZ,ERROR        ;open with LRL=original
02130           JR      NZ,SEND
02140 WAIT2     CALL    CLS
02150           LD      HL,MESS4        ;"Ready to send" message
02160           CALL    SHOW
02170 WAIT3     CALL    KEYWT           ;get keyboard starting signal
02180           CP      18H             ;Cancel?
02190           JP      Z,START
02200           CP      12H             ;CTRL R?
02210           JR      NZ,WAIT3
02220           CALL    CLS             ;Begin Buffer load & Send
02230           LD      A,1
02240           LD      (SENT),A        ;1st Block #
02250           LD      B,80H           ;128 Blocks to load (max)
02260           CALL    LOAD            ;Load File into Buffer
02270           LD      A,C
02280           LD      (RECS),A        ;save actual # of Blocks to send
02290           XOR     A
02300 WAIT4     LD      (TRYS),A        ;# of trys reset to 0
02310           CALL    KEYBRD
02320           CP      18H             ;Keybrd cancel?
02330           JP      Z,START
02340           LD      B,0AH           ;wait 10 times
02350           CALL    GETCHR
02360           JR      C,CNTDWN        ;to test send make this JR NAKIN
02370           CP      18H             ;Cancel Char?
02380           JR      Z,BACK1
02390           CP      15H             ;NAK Rec'd?
02400           JR      Z,NAKIN         ;If NAK then send this Block
02410 CNTDWN    LD      A,'*'
02420           CALL    DSPLY           ;show * for each wait time
02430           LD      A,(TRYS)
02440           INC     A
02450           CP      0BH
02460           JR      C,WAIT4         ;Try 10 times for NAK
02470           LD      HL,MESS5        ;Timed out, Restart to Terminal Mode
02480           CALL    SHOW
02490           CALL    KEYWT
02500           JP      START
02510 BACK1     LD      HL,MESS7        ;Cancel received, restart Session
02520           CALL    SHOW
02530           LD      HL,MESS6
02540           CALL    SHOW
02550           CALL    KEYWT
02560           JP      START
02570 NAKIN     CALL    CLS             ;Begin the 'send'
02580           CALL    FILOUT          ;Send the entire Buffer
02590           LD      A,4
02600           CALL    SENCHR          ;all done, send an 04 (EOT)
02610           LD      HL,MESS8
02620           CALL    SHOW
02630           LD      HL,MESS6
02640           CALL    SHOW
02650           CALL    KEYWT
02660           JP      START           ;Show "All Transmitted" & Restart
02670 LOAD      PUSH    DE              ;B contains # of BLKS to read
02680           PUSH    HL
02690           LD      HL,BUFFER       ;RAM position for Disk File Storage
02700           LD      C,1
02710 LOAD1     PUSH    HL
02720           PUSH    BC              ;B = # of blocks to load in
02730           LD      DE,DCB
02740           CALL    READ            ;Read in a Sector (or blk)
02750           POP     BC
02760           POP     HL
02770           JR      NZ,LAST
02780           DEC     B
02790           JR      Z,LDDON
02800           INC     C
02810           LD      A,(LRL)
02820           AND     A
02830           JR      Z,LONG
02840           LD      D,0
02850           LD      E,A
02860           ADD     HL,DE           ;Move Buffer Pointer ahead one LRL
02870           JR      LOAD1           ;keep loading file in till I/O error
02880 LONG      CALL    GET256          ;if LRL=256 then count as 2 blocks
02890           INC     C
02900           DEC     B
02910           JR      Z,LDDON
02920           JR      LOAD1
02930 LDDON     INC     C
02940 LDDON1    POP     HL
02950           POP     DE
02960           RET
02970 GET256    PUSH    BC              ;Load 2 128 Byte Blks from Sector
02980           LD      DE,BLK
02990           LD      B,0
03000 GET1      LD      A,(DE)
03010           LD      (HL),A
03020           INC     HL
03030           INC     DE
03040           DEC     B
03050           JR      NZ,GET1
03060           POP     BC
03070           RET
03080 LAST      CP      1CH             ;Disk 'error' an EOF?
03090           JR      Z,FINI          ;yes, then all done
03100           CALL    ERROR           ;no, bad read from Disk
03110           JR      LDDON1
03120 FINI      XOR     A               ;Whole file read into buffer
03130           JR      LDDON1          ;All done with Load
03140 GETCHR    PUSH    DE              ;General get a CHAR from MODEM Routine
03150 GETC1     LD      DE,0C350H       ;time delay constant
03160 GETC2     IN      A,(0EAH)
03170           AND     80H
03180           JR      NZ,CHRIN        ;Received anything?
03190           DEC     E               ;no, keep timing
03200           JR      NZ,GETC2
03210           DEC     D
03220           JR      NZ,GETC2
03230           DEC     B
03240           JR      NZ,GETC1
03250           POP     DE
03260           SCF
03270           RET                     ;timed out, set carry flag
03280 CHRIN     IN      A,(0EBH)        ;get the input character
03290           POP     DE
03300           PUSH    AF
03310           ADD     A,C             ;keep a checksum in (C)
03320           LD      C,A
03330           POP     AF
03340           OR      A
03350           RET
03360 ACK       LD      A,6             ;send back an ACK (06)
03370 SENCHR    PUSH    AF              ;General Send a CHAR to MODEM Routine
03380           ADD     A,C             ;keep checksum in (C)
03390           LD      C,A
03400 SENC1     IN      A,(0EAH)
03410           AND     40H
03420           JR      Z,SENC1         ;wait till Xmitter ready
03430           POP     AF
03440           OUT     (0EBH),A        ;send it
03450           RET
03460 FILOUT    LD      HL,BUFFER       ;Send the file in Buffer
03470           LD      A,(RECS)        ;# of 128 blocks to send
03480           LD      D,A             ;keep in (D)
03490 FILO2     PUSH    HL
03500           PUSH    DE
03510           CALL    SENBLK          ;send a block of 128 chars
03520           POP     DE
03530           POP     HL
03540           LD      E,0AH           ;try 10 times if problems
03550 FILO3     LD      B,0AH           ;wait 100 timeouts between blocks
03560           CALL    GETCHR          ;get response char in
03570           JR      C,NONE          ;Timed out, no response
03580           CP      18H             ;18H = Ascii CAN
03590           JP      Z,BACK1         ;CANCEL in so end session
03600           CP      15H             ;15H = Ascii NAK
03610           JR      Z,FILO2         ;NAK in, Send this Blk. again
03620           CP      6               ;ACK in, it was received ok
03630           JR      NZ,FILO2
03640 OK        LD      BC,0080H        ;ACK Rec'd send next Blk.
03650           ADD     HL,BC           ;move ahead in Buffer by 128
03660           LD      A,(SENT)
03670           INC     A               ;bump Blk #
03680           LD      (SENT),A
03690           DEC     D
03700           RET     Z               ;all blocks sent?
03710           JR      FILO2           ;yes all done
03720 NONE      DEC     E               ;Timed out 10 times
03730           JR      NZ,FILO3
03740           LD      HL,MESS11       ;yes so show message & restart
03750           CALL    SHOW
03760           LD      HL,MESS6
03770           CALL    SHOW
03780           CALL    KEYWT
03790           JP      START
03800 SENBLK    LD      A,1             ;Send a Block of 128 chars to MODEM
03810           CALL    SENCHR          ;Send an 01 to Signal BLK start
03820           LD      A,(SENT)        ;send this blk#
03830           CALL    SENCHR
03840           CPL                     ;Complement of Blk #
03850           CALL    SENCHR          ;send it
03860           LD      C,0             ;Checksum Starts at 0
03870           LD      B,80H           ;128 byte counter in (B)
03880 SENB2     LD      A,(HL)          ;Get Buffer Character
03890           CALL    SENCHR          ;Send each Data byte
03900           CALL    SCRPRN          ;Show char on screen
03910           INC     HL              ;bump buffer pointer
03920           DEC     B               ;all 128 done?
03930           JR      NZ,SENB2
03940           LD      A,C             ;all done get checksum
03950           CALL    SENCHR          ;send it
03960           PUSH    HL
03970           LD      HL,MESS9        ;show "Blk # Transmitted"
03980           CALL    SHOW
03990           LD      HL,MESS10
04000           PUSH    HL
04010           LD      A,(SENT)
04020           CALL    CONVRT
04030           POP     HL
04040           CALL    SHOW
04050           POP     HL
04060           RET
04070 CONVRT    LD      B,100           ;make Blk # ASCII in MESS10
04080           CALL    CONV1
04090           LD      B,10
04100           CALL    CONV1
04110           ADD     A,30H
04120           LD      (HL),A
04130           RET
04140 CONV1     LD      (HL),2FH
04150 CONV2     INC     (HL)
04160           SUB     B
04170           JR      NC,CONV2
04180           ADD     A,B
04190           INC     HL
04200           RET
04210 ;/////////////// End of Send a File /////////////////
04220 ;
04230 ;------------  Receive a File Module --------------
04240 RECEVE    CALL    CLS
04250           CALL    FILESP          ;Get Filespec
04260           LD      HL,BLK
04270           LD      DE,DCB
04280           LD      B,80H           ;LRL=128
04290           CALL    INIT            ;Open a new File
04300           CALL    NZ,ERROR        ;Disk Error?
04310           JR      NZ,RECEVE
04320           CALL    CLS
04330           LD      HL,MESS12       ;Ready to receive a File
04340           CALL    SHOW
04350 REC2      CALL    KEYWT
04360           CP      18H             ;Cancel?
04370           JR      NZ,REC21
04380           LD      DE,DCB
04390           CALL    CLOSE
```

Program continued on page 184

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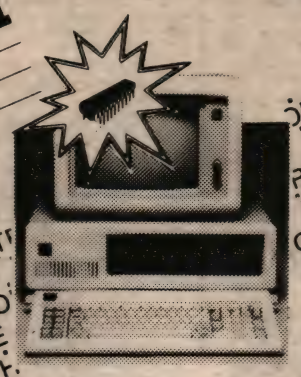
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Program continued from page 182

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04400           JP      START           ;Close file & restart
04410 REC21     CP      OFH             ;Ctrl O?
04420           JR      NZ,REC2
04430           CALL    CLS
04440           LD      A,1             ;Start receiving File
04450           LD      (RECS),A        ;set # of BLKS Received=1
04460 REC3      LD      (SENT),A
04470           LD      (TRYS),A        ;# of trys on this Blk.
04480           LD      HL,BUFFER       ;Start of RAM input Buffer
04490           LD      (CURNT),HL      ;Save current Pointer
04500           CALL    REWAIT          ;send NAKS while waiting
04510           JR      Z,NORESP        ;Timed out, Nothing in!
04520           JR      C,BLKERR        ;An error in receipt
04530           LD      DE,BUFFER       ;received 128 char Blk OK
04540           LD      BC,0080H
04550           CALL    DSKWRT          ;OK save 128 Bytes to Disk
04560           LD      A,1
04570           JR      REC3            ;Get the next Block
04580 BLKERR    LD      HL,MESS14       ;Received Wrong BLK!
04590 BLK1      CALL    SHOW
04600           LD      A,18H
04610           CALL    SENCHR          ;Send back a Cancel
04620           LD      DE,DCB
04630           CALL    CLOSE           ;Close file & Restart
04640           CALL    NZ,ERROR
04650           LD      HL,MESS6
04660           CALL    SHOW
04670           CALL    KEYWT
04680           JP      START
04690 NORESP    JR      C,GOEND         ;Flags show no Response
04700           LD      HL,MESS15
04710           JR      BLK1            ;show "Timed Out" & restart
04720 GOEND     CALL    ACK             ;OK, received block checks
04730           LD      DE,BUFFER
04740           LD      A,(SENT)
04750           DEC     A               ;get actual # to save
04760           LD      C,A
04770           LD      B,0
04780           CALL    DSKWRT          ;Write blocks into Disk File
04790           LD      DE,DCB
04800           CALL    CLOSE           ;Close File & Restart
04810           CALL    NZ,ERROR
04820           LD      HL,MESS8
04830           CALL    SHOW
04840           LD      HL,MESS6
04850           CALL    SHOW
04860           CALL    KEYWT
04870           JP      START
04880 REWAIT    XOR     A               ;Wait for a block & get it in
04890           LD      (TRYS),A        ;Start # of trys at 0
04900 REW2      LD      B,0AH
04910 REW4      CALL    GETCHR          ;Wait 10 times for 1st char.
04920           JR      C,CNTOUT        ;Nothing!
04930           CP      1
04940           JR      Z,BLKBEG        ;It's an 01, Start receipt
04950           OR      A
04960           JR      Z,REW2
04970           CP      4               ;EOT (04) all Blocks finished
04980           SCF                     ;set flags
04990           RET     Z
05000 CNTOUT    LD      B,1             ;No response this time
05010           CALL    GETCHR
05020           JR      NC,CNTOUT
05030           LD      A,15H           ;Send a NAK back
05040           CALL    SENCHR
05050           LD      A,'*'
05060           CALL    DSPLY           ;Show a * for each timeout
05070           LD      A,(TRYS)
05080           INC     A               ;bump no. of trys
05090           LD      (TRYS),A
05100           CP      0AH
05110           JR      C,REW2          ;keep waiting
05120           XOR     A               ;if 10, then set flags & quit
05130           RET
05140 BLKBEG    LD      B,1             ;Receive the Block
05150           CALL    GETCHR
05160           JR      C,CNTOUT
05170           LD      D,A             ;This is BLK #
05180           LD      B,1
05190           CALL    GETCHR
05200           JR      C,CNTOUT
05210           CPL                     ;Get next char.
05220           CP      D               ;Was 2nd char Compl.of 1st?
05230           JR      Z,OK2           ;yes go on
05240           JR      CNTOUT          ;Error in BLK # Send Retry code
05250 OK2       LD      A,D             ;get BLK #
05260           LD      (NEW),A         ;BLK # to receive
05270           LD      C,0
05280           LD      E,80H           ;128 Chars to receive
05290           LD      HL,(CURNT)      ;Set up Bufer Pointer
05300 REW3      LD      B,1
05310           CALL    GETCHR
05320           JR      C,CNTOUT
05330           LD      (HL),A          ;Save Data byte in Buffer
05340           CALL    SCRPRN          ;Show it on screen
05350           INC     HL              ;Bump buffer Pointer
05360           DEC     E
05370           JR      NZ,REW3         ;128 chars in?
05380           LD      D,C             ;Yes, get Checksum
05390           LD      B,1
05400           CALL    GETCHR
05410           JP      C,CNTOUT
05420           CP      D               ;Get Checksum & compare
05430           JP      NZ,CNTOUT       ;No Good, Send Retry
05440           LD      A,(NEW)
05450           LD      B,A
05460           LD      A,(RECS)
05470           CP      B               ;Check this BLK#
05480           JR      NZ,WRONG        ;not 'next' one??
05490           PUSH    AF              ;It's OK
05500           PUSH    HL
05510           PUSH    AF
05520           LD      HL,MESS9
05530           CALL    SHOW
05540           LD      HL,MESS13       ;Show "BLK# .. received"
05550           POP     AF
05560           PUSH    HL
05570           CALL    CONVRT
05580           POP     HL
05590           CALL    SHOW
05600           POP     HL
05610           POP     AF
05620           INC     A
05630           LD      (RECS),A        ;Bump to Next BLK #
05640           LD      A,(SENT)
05650           INC     A
05660           AND     A
05670           CP      81H             ;Received 128 Blocks?
05680           JP      NC,KEEPUP       ;yes, wait for next 128 Blks
05690           LD      (SENT),A
05700           LD      (CURNT),HL
05710 ACKOK     CALL    ACK             ;Send back an ACK
05720           XOR     A
05730           LD      (TRYS),A
05740           LD      B,1
05750           JP      REW4            ;Keep getting in Blocks
05760 DSKWRT    PUSH    BC              ;Write a block of 128
05770           PUSH    DE              ;  to the Disk File
05780           PUSH    HL
05790           EX      DE,HL
05800 DSK2      PUSH    HL
05810           PUSH    BC
05820           LD      DE,DCB
05830           CALL    WRITE
05840           POP     BC
05850           POP     HL
05860           JR      NZ,DSK3
05870           LD      DE,0080H
05880           ADD     HL,DE
05890           DEC     BC
05900           XOR     A
05910           CP      C
05920           JR      NZ,DSK2
05930           CP      B
05940           JR      NZ,DSK2
05950 DSK3      POP     HL
05960           POP     DE
05970           POP     BC
05980           RET
05990 WRONG     INC     B               ;Check wrong Block#
06000           CP      B
06010           JR      Z,ACKOK         ;OK it was last resent
06020           XOR     A               ;No, it's wrong block
06030           INC     A
06040           SCF
06050           RET
06060 KEEPUP    XOR     A               ;128 blocks received,
06070           INC     A               ; call for another batch
06080           RET
06090 ;------------ End of Receive a File  -------------
06100 ;
06110 ; .......... MESSAGES FOLLOW ..........
06120 MESS1     DEFM    '                       '  ;20 spaces
06130           DEFM    'T E R M I N A L  Mode'
06140           DEFB    0DH
06150           DEFM    'use <CTRL> F  for FILE TRANSFER'
06160           DEFB    0DH
06170           DEFM    'use <CTRL> X  to exit to DOS'
06180           DEFB    0DH
06190           DEFM    ' ..... READY .... '
06200           DEFW    240DH
06210 MESS2     DEFM    '     .           .          '  ;15 spaces
06220           DEFM    'F I L E   T R A N S F E R  Mode'
06230           DEFB    0DH
06240           DEFM    '<CTRL> X  Aborts File Transfer'
06250           DEFW    0D0DH
06260           DEFM    '   SEND a File ... (1)'
06270           DEFB    0DH
06280           DEFM    '      RECEIVE a File ... (2)'
06290           DEFB    0DH
06300           DEFM    '         Disk DIRECTORY ...  (3)'
06310           DEFW    240DH
06320 MESS3     DEFM    'FILESPEC: $'
06330 MESS4     DEFM    ' .... File opened ...'
06340           DEFB    0DH
06350           DEFM    '            press  <CTRL> R to start SENDING'
06360           DEFW    240DH
06370 MESS5     DEFM    'Session CANCELLED ...'
06380           DEFB    0DH
06390           DEFM    'No NAK Received to start'
06400           DEFB    0DH
06410 MESS6     DEFM    '                ..... Press any Key$'
06420 MESS7     DEFM    'Session CANCELLED by Cmd. Received'
06430           DEFW    240DH
06440 MESS8     DEFM    '... TRANSMISSION Completed...'
06450           DEFW    240DH
06460 MESS9     DEFW    0D0DH
06470           DEFM    'BLOCK $'
06480 MESS10    DEFW    0
06490           DEFB    0
06500           DEFM    ' Transmitted'
06510           DEFW    240DH
06520 MESS11    DEFM    'Session Cancelled by too many RE-TRYS!'
06530           DEFW    240DH
06540 MESS12    DEFM    'File Created...'
06550           DEFB    0DH
06560           DEFM    '         Press <CTRL> O to begin Receiving'
06570           DEFW    240DH
06580 MESS13    DEFW    0
06590           DEFB    0
06600           DEFM    ' Received'
06610           DEFW    240DH
06620 MESS14    DEFM    'Wrong BLOCK Received!!'
06630           DEFW    240DH
06640 MESS15    DEFM    'Session CANCELLED ...'
06650           DEFB    0DH
06660           DEFM    'Timed Out !!!!'
06670           DEFW    240DH
06680 MESS16    DEFM    'Drive No. :$'
06690 ;.... VARIABLES ...
06700 LRL       DEFB    128             ;Logical Record Length
06710 SENT      DEFB    1               ;# of Blks SenT (or recv'd)
06720 RECS      DEFB    0               ;# of Blks to Send
06730 TRYS      DEFB    0               ;# of Trys to send this blk.
06740 NEW       DEFB    1
06750 CURNT     DEFW    BUFFER          ;Buffer Pointer
06760 ;
06770 ;... STORAGE (BUFFERS)
06780 DCB       DEFS    32              ;Disk DCB location
06790 INPUT     DEFS    32              ;Keyboard input Buffer
06800 BLK       DEFS    256             ;Disk RAM input Buffer
06810 ;
06820 BUFFER    DEFB    0               ;TEXT BUFFER must be last!
06830           END     START
```

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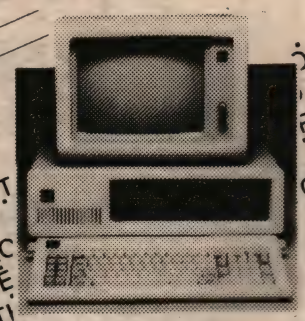
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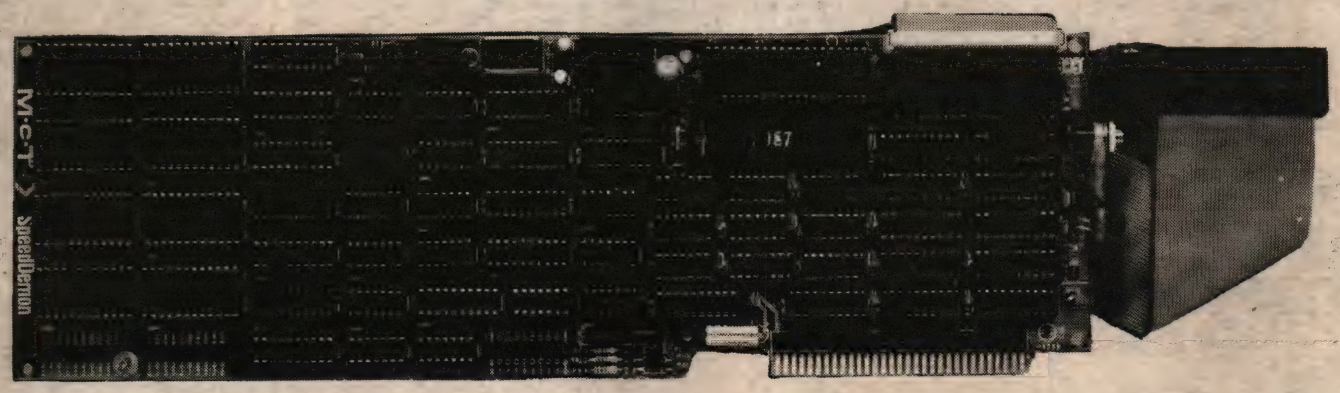
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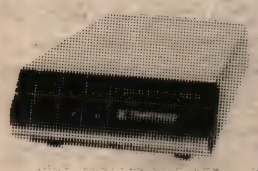
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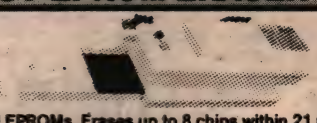
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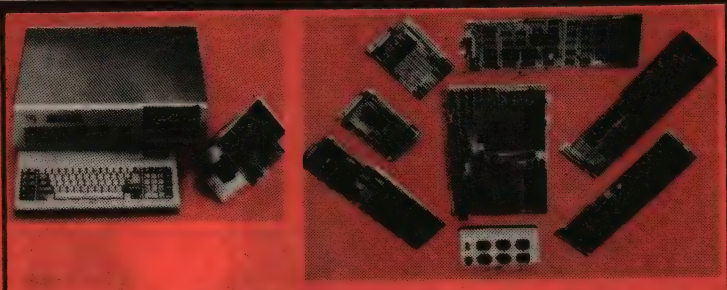
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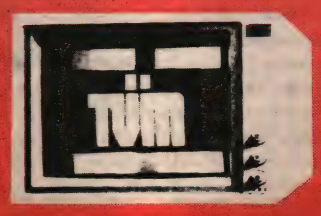
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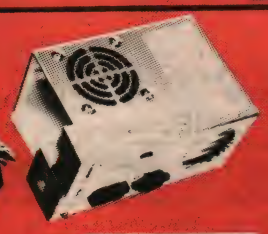


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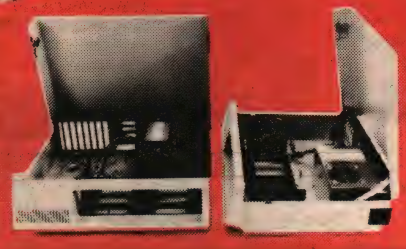
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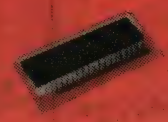
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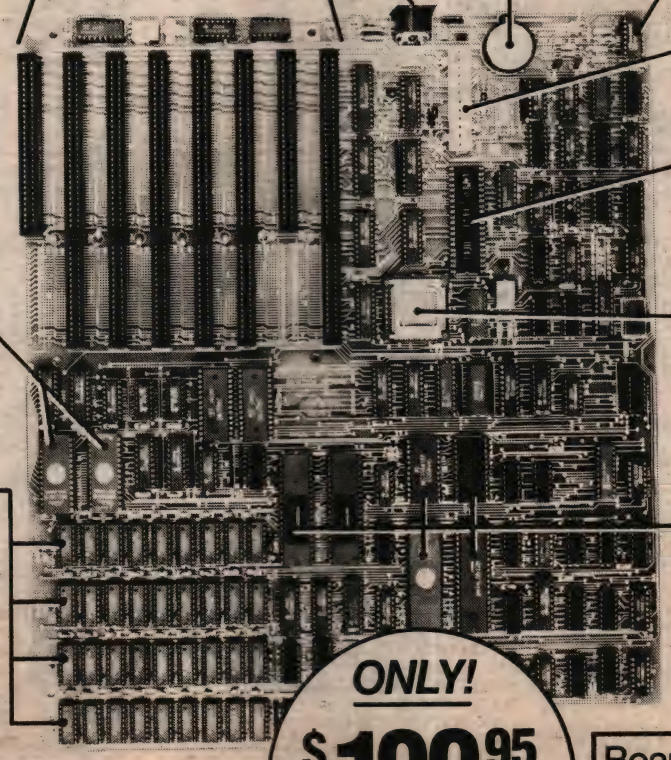
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Titusville, FL 32781

ABBS Apple Mate. New York. NY 201-864-5345
ABBS CNNJ. Pompton Plains. NJ 201-835-7499
ABBS Livingston. NJ 201-994-9620 *24
AMIS .Park Ridge. NJ 201-391-5519
APPLE OASIS, Chester. NJ 201-879-4392. 5pm-12am
ARMUDIC Washington. DC 201-276-8342
ATARI, Edison. NJ 201-549-7591
BACE BBS, Westfield. NJ 300/1200 Baud. 201-232-1730*
BACPACK BBS, Watchung. NJ 201-755-6858
BBS, Haledon. NJ 201-790-6795
THE BEACH, Bay Head. NJ 201-892-8172
CASTLE WESTERBURG, East Brunswick, NJ 201-238-6166 *24
CFONJ/TBBS, Linden. NJ 201-486-2956. 300/1200 Baud *24
COCO CREATIONS, Jackson. NJ 201-928-9488 *24
COMBOARD-64, Teaneck. NJ 201-833-2846 7pm-7am
CONFERENCE THREE Flagship. Denville. NJ 201-627-5151 *24
DAVID'S PLACE, Hillsdale. NJ 201-666-7696 *24
DIAL-YOUR-MATCH #14 201-272-3686
EAGLES INN, Marlboro. New Jersey. 201-536-8206*
ENDIXX BBS, Matawan. New Jersey 201-583-4882 (3PM-10PM)
F.B.I., Neptune. NJ 201-922-9836 8am to 10pm--7days a week
F.I.B.B.S. Fanwood. NJ. Atari BBS. 300 Baud 201- 322-6862 *24
GALAXY III, Maplewood. NJ 201-763-5889 *24
GENERAL STORE, Hillside. NJ 201-666-2646 *24
HUDSON COUNTY COMMODORE BBS, Union City. NJ 201-864-7430 *24
IBM RBBS ESSAYS SOLICITED, 300/1200 BAUD ASCII MODEM 201-858-2742 *24
LE ??? SHOPPE, 300/1200. 201-747-8346 9PM-9AM
THE MAGIC BAG, Neptune. NJ 201-988-9489 *24
MAIN BASE OF THE UNION, The Circus 201-592-0456
MICRO CHART, Hackensack. NJ 201-342-8101 300/1200 BAUD *24
M.O.M.'S BBS Edison. NJ 201-738-4982*
MICRO-PHONE/TBBS, Metuchen. NJ 201-494-3649 *24
MONMOUTH COUNTY TECHIE, Howell. NJ 201-370-4756
NEW JERSEY TELECOM, 201-635-0705 *24
NORTHERN NEW JERSEY BBS, W. Milford, NJ 201-728-8333 *24
OMEGAMMON RBBS, Jersey City. NJ 201-653-3893 *24
PMS- Rutgers Univ. Microlab Piscataway. NJ 201-932-3887
THE PIRATES COVE, 201-780-0240*
PIRATES NEST AE, Sussex. NJ 201-875-3384 300 BAUD. PW=DEVO: 9am-9pm 7days/week
THE POLICE STATION TBBS, IBM 300/1200/2400. Hoboken. NJ 201-963-3115
THE RADICAL BOARD, 201-837-8504 *24
RATS Systems 201-887-8874
RCP/M MCBBS Flanders. NJ 201-584-9227 *24
RCP/M TPM (RIBBS) Englishtown. NJ 201-446-6359 *24
RCP/M RBBS Ocean. NJ 201-775-8705
RCP/M RBBS Rutgers New Brunswick. NJ 201-932-3879 *24
THE REALM OF EVIL, Apple II. 201-694-1547 *24
SILVER SURFER'S BEACH, 201-398-8761
SKYLANDS BBS Ringwood. NJ 201-962-4956 *24
THE STADIUM, Waldwick, NJ 201-445-8055
STAR FLEET COMMAND, Atari. 201-839-3062 *24
STUDIO 64, C-64. 201-696-0639 *24
SYNDICATE BBS, Middlesex. NJ 201-968-8148 300 BAUD *24
TIBBS Brick. NJ 201-477-7263
TIBBS Tom's River. NJ 201-929-8161
THE TRON BOARD, North Bergen. NJ 201-869-5460
THE WAR ROOM, Bloomfield. NJ 201-743-8653; 300/1200 BAUD *24
XEVIDUS ISLAND, Atari. 201-835-8340 *24

ARMU Washington. 202-276-8342
DYNABOARD-64, Washington. D.C. 202-686-5230 *24
PCP/M RBBS Cranford. NJ 202-272-1874
PSBBS Washington. D.C. 202-337-4694 *24
F.S.L.-COMMODORE Washington. D.C. 202-745-2973 *24

64 NEWSROOM BBS, Northfield. CT 203-484-0178 6pm-8am weekdays. *24 on weekends

BULLET-80 Danbury. CT 203-744-4644
BULLET-80 Seymour. CT 203-888-7952
COLORAMA OF WESTBROOK, Westbrook. CT 203-669-1165 *24
COMPUTER TOOLBOX, Waterbury. CT 203-271-1579; 300/1200 BAUD *24
GATEWAY FIDO, CT 203-669-8896
THE HORNETS NEST HBBS/IAE. CT 203-453-1235 *24
INADEX, Cheshire. CT 203-271-1203 7am-10pm (eastern time)
MET-CHEM-BBS Hamden. CT 203-281-7287 business hours
THE PHANTOM ZONE Stamford. CT 203-356-9679 *24
THE SWITCHBOARD NETWORKS Clinton. CT 203-669-3456 *24
TELECOM 7 New Fairfield. CT 203-746-5763 *24
TOTAL BOARD Meriden. CT 203-634-0052 *24

The BULLETIN BOARD Tuscaloosa. AL 205-758-5017 Monday. Wednesday. Friday. Saturday. Sunday 8pm-7am
FORUM-80 Montgomery. AL 205-272-5069
RCP/M RBBS Huntsville. AL 205-895-6749

99 BBS, Aberdeen. WA 206-533-0951
ABBS Apple Crate I. Seattle. WA 206-935-9119
ABBS Apple Crate II. Seattle. WA 206-244-5438
A-C-C-E-S-S Olympia. WA 206-866-9043 *24
AMIS Space Washington. 206-525-3412
ARBB Seattle. WA 206-546-6239
THE CHAMELEON CIRCUIT, Everson. WA 206-966-4855; 300/1200 BAUD: 10pm-8am
THE CONSTANT SOCIETY, Seattle. WA 206-525-5947
DIAL-YOUR-MATCH #16 206-256-6624
ESKIMO NORTH, Seattle. WA 206-367-3837 *24
FORUM-80 Seattle. WA 206-723-3282
IQ TECHNOLOGY, Washington. D.C. 206-451-0232
JCTS Redmond. WA 206-883-0403 *24
MAIL Board-82 Seattle. WA 206-527-0897 *24
MINI-BIN Seattle. WA 206-762-5141
MSC-80 Everett. WA 206-334-7394
MTG ELECTRIC BBS Marysville. WA 206-653-3801
PCP/M Silicon Valley 206-458-3086
PMS-SOFTWARE Unlimited Kenmore. WA 206-486-2368 *24
SEACOMM-80 Seattle. WA 206-763-8879 *24
SHERWOOD FOREST, Tacoma. WA 206-582-5188
SLIME WORMS WORLD, Tacoma. WA 206-535-6850 300/1200 BAUD *24
WHIDBEY ISLAND COMPUTER SOCIETY, Oak Harbor. WA 98277 206-675-9786

ADVENTURE IN THE TRIVIAL DIMENSION Windham. ME 207-892-9810
BLACK BEAR'S DEN (IBM & Macintosh) Old Town. ME 207-827-7517 8pm to 9am daily. 9am to noon weekends
CONFUSER USER Windham. ME 207-854-2687
DOWNEAST CONNECTION, 300/1200 baud TIBBS. 207-797-5690 *24
EQUS, ME. Prometheus 300/1200 baud. 6am-6pm. 207-374-2203
MAGIC CRYSTAL Windham. ME 207-774-5570
TIBBS, Portland. Maine 207-797-5690

ANLN, Hayden Lake. ID 208-772-6134 *24
IDAHO TELECOM SERVICE Rigby. ID 208-745-9438 *24
IFBBS Idaho Falls. ID 208-523-7400. 300/1200 baud *24
IDAHO BBS EXPRESS, Idaho Falls. ID 208-529-3036

RCP/M CBBS, Visalia. CA 209-733-5588 300/1200/2400 BAUD *24
DIAL-YOUR-MATCH #26 Clovis. CA 209-298-1328

AMIS, Info New York. 212-767-6633
BULLET-80 New York, NY 212-740-5680 *24
COMM-80 Queens. NY 212-897-3392 *24
THE DATABASE BBS, 212-772-7167
FIRST BASIS BOARD, New York City. NY 212-666-5015
GRAND CENTRAL TERMINAL 212-682-0681 *24
NET-WORKS New York. NY 212-410-0949
PALADIN'S PALACE, FOREM CBB. Queens. NY 212-699-0861 *24
PIRATE'S LANE, NYC. NY 212-421-7093
VINEYARD COMPUTER WORLD, NY 212-357-5679 *24

64 SHOPPER Downey CA 213-566-2937
ABBS Computer Conspiracy Santa Monica. CA 213-829-1140
ABBS Pacific Palisades. Los Angeles. CA 213-459-6400
ALL NIGHT BBS 213-564-7636
AMIS TABBS. CA 213-366-2125
AMIS WVAUG. CA 213-783-8373
BBS B.R. Los Angeles. CA 213-394-5950 *24
BBS-64 SHOPPER, Downey. CA 213-566-2937 *24
CHECKER BOARD Torrance. CA 213-538-9795
COLORAMA OF LAX, CA 213-673-4045 *24
COMMODORE BBS, Los Angeles. CA 213-737-7581 *24
COMPUCENTER Los Angeles. CA 213-320-0222; 300/1200 BAUD *24
COMPUTER CONNECTION 213-657-1799
COMPUTER CONSULTANT'S NETWORK, West Los Angeles. CA 213-479-4074. 300/1200 baud *24
COMTELL, Los Angeles. CA 213-470-2673; 300/1200 BAUD *24
CONFERENCE-TREE #4 Santa Monica. CA 213-394-1505
CONFERENCE-TREE Kelp Bed. Los Angeles. CA 213-372-4800

DATAMATE Canoga Park. CA 213-998-7992
DIAL-YOUR-MATCH -1 213-842-3322
DIAL-YOUR-MATCH -4 213-783-2305
DIAL-YOUR-MATCH -7 213-840-8252
DIAL-YOUR-MATCH -9 213-345-1047
DIAL-YOUR-MATCH -11 213-242-1882
DIAL-YOUR-MATCH -25 213-842-9452
DIAL-YOUR-MATCH -28 213-764-8000
DRAGONS GAME SYSTEM 213-428-5206
ELECTRIC LINE CONN. Sherman Oaks. CA 213-789-9512
FUNNY PHARM, CA 213-410-0221 *24
FUNNY PHARM, II, CA 213-631-7328 *24
FUNNY PHARM IV, CA 213-822-3553 *24
FUNNY PHARM V, CA 213-631-2911

FUNNY PHARM VI, CA 213-316-6033
GAMENET Palos Verdes. CA 213-541-8039 *24
GREENE MACHNE FRICASEED CHICEN, Arcadia. CA 213-445-3591
GREENE MACHINE Temple City. CA 213-287-1363
KANDY SHACK -3 Artesia. CA 213-402-1616
KLUGE COMPUTER 213-947-8128 *24
L.A. INTERCHANGE, Los Angeles. CA 213-631-3186 *24
LONG BEACH COMMUNITY COMPUTER 213-591-7239 *24
LYNZIE'S MOTHERBOARD, N. Hollywood. CA 213-271-2829
MARINA MATCHUP, Los Angeles. CA 213-390-3239
MARTIAN BOARD, Los Angeles. CA 213-271-2829
NET-WORKS Coin Games Los Angeles. CA 213-336-5535
NET-WORKS Computer World Los Angeles. CA 213-859-0894 *24
NAVATION CO., Los Angeles. CA 213-881-6880
NET-WORKS Magnetic Fantasies Los Angeles. CA 213-388-5198
NET-WORKS Softwarx Los Angeles. Ca 213-473-2754
ORACLE, North Hollywood. CA 213-980-5643
PASBBS Torrance. CA 213-516-7089 *24
PMS Los Angeles. CA 213-334-7614 *24
PMS O.A.C. Woodland Hills. CA 213-346-1849 *24
RBBS OF PACIFIC PABSADES Los Angeles. CA 213-459-6480 *24
RCP/M RBBS Downey. CA 213-861-2313 *24
RCP/M CBBS Pasadena. CA 213-799-1632 *24
RCP/M RBBS BBS Valley 213-360-5053
RCP/M RBBS Palos Verdes. CA 213-541-2503 *24
RCP/M RBBS Softwar Store Los Angeles. CA 213-296-5927 *24
THE WARGAMES RBBS, Santa Monica. CA 300/1200/2400. 213-393-7227*

ABBS Dallas Info Board 214-248-4539
ABBS Teledunjon Dallas. TX 214-960-7654
ABBS Teledunjon I Dallas. TX 214-530-0858
AMIS Allen. TX 214-727-2824 *24
AMIS Dallas. TX 214-680-9018
ANLN Dallas. TX 214-263-3109 *24
BBS-80 DALTRUG Dallas. TX 214-235-8784 *24
BULLET-80 Hawkins..TX 214-769-3036
COMPUTER RESET, Garland. TX 214-272-7920 8am-12am
METROPLEX CP/M INTEREST GROUP RBBS/RCPM Plano. TX 214-867-2068 *24
MICROSERVE (TBBS), Tyler. TX 214-581-3722. 300/1200/2400 *24
NET-WORKS Apple Grove. Dallas. TX 214-644-5197
NET-WORKS Apple Shack. Dallas. TX 214-644-4781 *24
NET-WORKS Electric Computer Dallas. TX 214-239-5482
NET-WORKS Winesap Dallas. TX 214-824-7455
RCP/M CBBS Dallas. TX 214-913-8274
TBBS OF TYLER, Tyler. TX 214-566-1374; 300/1200/2400 BAUD: Atari. TRS-80. Kaypro *24
T.R.A.I.N. BBS, Ennis. TX. Atari. 214-875-9818

AMIS BBS. Pennsylvania 215-333-3753
AMIS Pennsylvania 215-250-9471
AMIS Pennsylvania 215-432-9848
A-NET EAGLE'S NET, Philadelphia. PA 215-969-3384
BULLET-80 Langhorne. PA 215-364-2180
C.B.M. ONLY, West Lawn. PA 215-678-7691 300 BAUD *24
COMNET-80 North Wales. PA 215-855-3809
COMPCOM 215-968-0170 300/1200 *24
DS CAB, West Lawn. PA 215-678-7691 *24
HEMRES-80 Allentown. PA 215-434-3998
LEHIGH PRESS BB, PA 215-435-3388
RBBS Pennsylvania 215-398-3937
RBBS Pennsylvania 215-836-5116
TIBBS Philadelphia. PA 215-927-6432 *24
TIBBS Reading. PA 215-929-5348
TI-TALK Reading. PA 215-372-1154; 300 BAUD *24

AKRON DIGITAL GROUP Akron. OH 216-745-7855 *24
AMHERST, Amherst. OH 216-988-8806
ARCADIA BBS Akron. OH 216-644-1014
ATARI Ohio 216-582-2797
ATARI EXPRESS Akron. OH 216-253-9247
ATARI PRISM Akron. OH 216-867-2422
BBS Computer Applications Poland. OH 216-757-3711
THE BLACK HOLE 64 Elyria. OH 216-322-7184 9pm to 6am
BIG BOARD (CP/M) Akron. OH 216-745-7819
BULLET-80 Chesterland. OH 216-729-2769
CAMELOT ATARI BBS Akron. OH 216-864-7002 *24
CLOUD NINE, 216-650-2989 *24
COMNET-80 Akron. OH 216-645-0827 *24
THE COMMODORE ARCADIA, 216-644-1014. 11pm-9am est.
COMMODORE'S BRIDGE Akron. OH 216-929-1454
COMMODORE CHIP Akron. OH 216-678-5033 *24
COMMODORE CLIPPER Akron. OH 216-928-4123 *24
COMMODORE COMMANDER Akron. OH 216-923-0347
THE COMMODORE CRUSADER, 216-864-8924 *24
COMMODORE EXPRESS Akron. OH 216-253-9247
THE COMMODORE GATEWAY, 216-896-9001 *24

COMMODORE RAINBOW Akron. OH 216-644-5516 *24
COMMODORE REALM Akron. OH 216-666-9463, 10pm-7am est.
THE COMPUTER EXPERIENCE, Cleveland. OH 216-946-9076 *24
COMPU-CENTER, Akron. OH 216-929-4803 *24
COMPUTER EXPERIENCE 216-946-9076 *24
COPLEY ATARI Akron. OH 216-666-8961
THE DARK TOWER Rogers. OH 216-227-3245 *24
FIRECOMM Akron. OH 216-666-0306
FIRESTONE PARK ATARI Akron. OH 216-724-7760
THE FOURTH DIMENSION, 216-644-4597 *24
FORUM-80 Cleveland. OH 216-486-4176
THE GOLDEN KEEP, 216-896-9147 *24
HENRIETTA OUTHOUSE,Oberlin. OH 216-965-8151 8pm-7am
MEGA-FORCE BBS Akron. OH 216-699-9055
NEW AGE BBS Cleveland. OH 216-451-3280
NIGHT STALKER Akron. OH 216-376-6443
PIRATES DELIGHT Akron. OH 216-672-7580 *24
PMS Massillon. OH 216-832-8392 *24
PMS RAUG Akron. OH 216-867-7463 *24
RAILNET BBS Cleveland. OH 216-883-6298 *24
RBBS Lorain. OH 216-282-3423
RUBBER CITY ATARI Akron. OH 216-376-7618
S.T.A.R. BBS -1, Akron. OH 216-753-1199 *24

S.T.A.R. BBS -3, Akron. OH 216-753-5379
TBBS of Akron 216-724-2125 *24
TBBS OF SOUTH SUMMIT Akron. OH 216-724-1963 *24
TBBS OF TALLMADGE Akron. OH 216-633-7483 *24
TECHIE Cleveland. OH 216-944-1072
TIMEX BULLETIN SERVICE, Parma. OH 216-661-4105
UNDERGROUND 64 Lorain. OH 216-282-8848 8pm-7am days
VICCOMM Akron. OH 216-896-0775 *24

CENTRAL IL CONNECTION Riverton. IL 217-629-7006 *24
NET-WORKS C.A.M.S. Decatur. IL 217-429-5541
TRS-80 Effingham. IL 217-347-5884 *24

NORTH MINNESOTA APPLE LINE, Hibbing. MN 218-262-5746

AMIS Hart City. Elkhart. IN 219-262-3980
AMIS BBS Parlor City. Bluffton. IN 219-824-5198 *24
BBS 219-422-9180 *24
DARK CASTLE Warsaw. IN 219-269-5957 *24
ELKHART TOWNE CRIER Elkhart. Indiana 1200/300 Baud 219-875-8754 *24
FREMONT TOWN CRIER BULLETIN BOARD Fremont. IN 219-495-9747: 3:00pm until 8:00am on weekdays and 24 hours on weekends and holidays
LAKE COMPUTER DEPOT, TIBBS 219-659-5628 *24
MEGA NET BBS Mishawaka. IN 219-259-4366
TIBBS-LAKE COMPUTER DEPOT Whiting. IN 219-659-1245 *24

ARMUDIC Computer Age Baltimore. MD 301-587-2132
ATARI Severna Park. MD 301-544-2460
BBS IBM 300/450/1200 BAUD. 301-267-4930 *24
BBS IBM PC Rockville. MD 301-949-8848 *24
BLACK PATCH SYSTEMS 300/1200 Baud Atari 301-974-1274
COMMODORE MANIA! Potomac. MD 301-251-0599 *24
DARK STAR BBS, Baltimore. MD 301-444-1245 *24
ELITE SYSTEMS Atari. 301-974-4987 *24
HARVESTER BAPTIST CHURCH, Columbia. MD 301-995-0032
HEX Silver Spring. MD 301-593-7033 *24
HIDDEN REALM Glen Burnie. MD 301-768-1636
MYSTICAL FRONTIER (FIDO 468), Pasadena. MD 301-760-6187 *24
O'ZONE (DYM) Joppatowne. MD 301-679-6306
PMS Ellicott City. MD 301-465-3176
also Laurel. MD 301-596-0123
SALISBURY TOWNE CRIER (SALTC) Salisbury. MD 301-543-8845

ATLANTIS, Dover. DE 302-674-0859; Franklin Computer: 6pm-7:30am. *24 weekends
CONRAD'S FSCC Milford. DE 302-422-0923. 10pm-7am
DATA LINK COMPUTER WAREHOUSE Denver. CO 303-934-3693
KRICKIT Dover. DE 302-734-0179. 10pm-7am
LARRY'S ABBS Newark. DE. Voice 302-731-1583 Modem 302-737-7788
TIBBS Newark. DE 302-322-3999

A.M.I.S. Denver. CO 303-978-0298 *24
A.M.I.S. Denver. CO 303-758-2927 *24
AMIS Denver. CO 303-758-6233
APPLE PI BOARD Denver. CO 303-469-7541 *24
ATARI CO 303-221-1779
AURORA NETWORKS Denver. CO 303-343-8401 *24
BAHA'I BOARD TBBS Denver. CO 303-449-3306 *24
BARDNET Ft. Collins. CO 303-493-1068
BBS IBM PC, Denver. CO 303-773-2699 *24
COLORADO DEPT. OF EDUCATION Denver. CO 303-572-1093 *24
COM-MART, Aurora. CO 303-695-0783 *24
COMM-NET Denver. CO 303-366-3898. 366-7177. 430-2473 *24
THE COMPUTER FARM Colorado Springs. CO 303-632-0660 *24
THE CONTROLLER BOARD TBBS ISLAND Denver. CO 303-690-9423
CONNECTION-80 Denver. CO 303-4566 *24
CP/M SIG RCP/M w/CBBS Denver. CO 303-465-1313 *24
DATA BANK Denver. CO 303-494-0167 *24
DATA-LINE Denver. CO 303-320-4102 *24
DENHUG BBS Denver. CO 303-423-3224 *24
DYM -118 THE BROKERAGE—THE BROKER Denver. CO 303-796-9721 *24
ELECTRIC MAGAZINE 303-340-2473 *24
ELECTRONIC LOCKSMITH—TOP SECURITY SYSTEMS Denver. CO 303-973-2167 *24
FIDO-NET Denver. CO 303-973-9338 *24
FIDO-NET GMCC (-77) Denver. CO 303-497-6968 *24
FIDO-NET -334 Denver. CO 303-497-6968
FRONT RANGE BBS (TRS-80) Denver. CO 303-772-7229 *24
FORUM-80 #2 Denver. CO 303-399-8858 *24
GOLD STRIKE BOARD Denver. CO 303-278-1487 *24
GULLIVER'S BOARD Denver. CO 303-690-1343 *24

HBBS Denver. CO 303-343-8401 *24
THE HOLLOW THE DRUID Denver. CO 303-329-6342 *24
I.D.S. STARCROSS Denver. CO 303-781-8212 *24
INTERCOMEX Denver. CO 303-367-1935 *24
PCjr-NET ³-JR-NET -4, (Englewood. CO 303-789-4610 *24
RCP/M CUG-NOTE Denver. CO 303-781-4937 *24
RCP/M RBBS Arvada Elec. Colorado Springs. CO 303-634-1158 *24
RCP/M RBBS Boulder. CO 303-499-9169
STAR BOARD ROCKY MTN 99ers. Denver. CO 303-455-3113 *24

NETWORKS ABBS Info International NW. Reedy. WV 304-927-1773
NET-WORKS Charleston. WV 304-345-8280
TRI-STATE AREA BBS Huntington. WV 304-429-3918
WEIRTON PERSONAL COMPUTER ASSOCIATION Weirton. WV 304-797-1302

A.C.C./P.B. B.B.S., Pal Beaches. FL 305-433-3333
ADULTS ONLY I TBBS. Miami. FL 305-935-1136 *24

ADULTS ONLY II TBBS. Miami. FL 305-594-4526 *24
ALTERNATIVE UNIVERSE, 305-793-2792 *24
THE ATARI COMPUTER CLUB OF THE PALM BEACHES, 305-585-7879 3pm-8am
THE ATARI EXPRESS, 305-961-5221 *24
ATLANTIS, 305-920-6203 *24
AUTOBOARD -1-COMMODORE-Stuart Users' BBS (STUBBS) Stuart. FL 305-286-2509 *24
BBS Homestead. FL 305-246-1111
BACKSTREETS, 305-937-2838 *24
BBS, Vero Beach. FL 305-231-6435
BBS DIRECTORY, 300/1200 BAUD. 305-231-6435. 7pm-9am/24hrs weekends.
C-64 BBS1 305-238-2271. This is a Punter BBS
CABLE BOX, Pembroke Pines 305-432-5969 *24
CECIL'S NITE OWL Palm Bch.. FL 305-588-0487 *24
CHALKBOARD Hollywood. FL 305-962-6052 *24
COLOR BURST Ft. Lauderdale 305-525-1192 *24
COMNET-64 (COMMODORE), Tamarac. FL 305-726-4390
CORAL REEF I, 305-432-2766 *24
THE CRYPT, 305-921-7252 *24
CRYSTAL PALACE (ATARI) 305-722-1697 *24
DIAL-YOUR-MATCH Sunrise. FL 305-741-2308
DR. DATA CBBS-RCP/M, Sunrise. FL 305-741-0835; 300/1200 BAUD *24
EL-SHIFT-OH Cocoa. FL 305-783-8905 *24
EMERALD CAVERN Hollywood. FL 305-981-4252
FORUM-80 Ft. Lauderdale. FL 305-772-4444 *24
FREEWAY XCHANGE BBS, (Commodore 64) Miami. FL 305-895-7727. 6PM to 12AM
GREENE MACHINE SPACECOAST 305-268-8356 *24
GREEN MACHINE SPACECOAST 2 305-453-6561 *24
MAGIC CITY WORLD OF TRON Miami. FL 305-264-9964 *24
MCM MICRO CITY Homestead. FL 305-247-6173 *24
MUGSY'S HIDEOUT, 305-961-3829 *24
NET-WORKS BIG APPLE Miami. FL 305-948-8000
NET-WORKS CAVE, Hollywood. FL 305-961-8685 *24
THE NOTEBOOK, 305-655-4713
NOVA, Merritt Island. FL 305-453-0079 *24
ONE STEP BEYOND, Longwood. FL 305-831-0032
PC-RAIN/NODE IV Boca Raton. FL 305-994-3644
THE PINNACLE BBS, Hollywood. FL 305-922-4440 *24
QUILL, AMIS BBS Palm Bay. FL 305-724-2303
RBBS HEATH KIT 305-823-2281 6pm-8am
RBBS SOUTHERN MICRO 305-625-3181 *24
THE RAINFOREST BBS, 2400/1200/300 305-434-4927*
SCAUG BBS Merritt Island. FL 305-453-6998
SHADOW WORLD, 305-653-9856 *24
SPACE SHUTTLE BBS (SSBBS) Satellite Beach. FL 305-777-4714 *24
T.I.B.B.S. (CPU), 305-583-4343 *24
TBBS Orlando. FL 305-644-8327 *24
TECH-80 305-266-1032 *24
THE BYTE SHOP 305-261-3639. Networks No. BBS
TIBBS West Palm. FL 305-793-8050
TRADE 80 Ft. Lauderdale. FL 305-525-1192
TRADE 80 of Miami 305-947-7930 *24
TRADE 80 Pompano Bch. 305-426-8080 *24
TREASURE QUEST Vero Beach. FL 305-562-1627 *24
UNICORN, AMIS BBS Palm Bay. FL 305-729-9575
W.S.C.P. World Society of Commodore Programmers. Ft. Pierce. FL 305-461-0403
YBBS The Heath Bar 305-940-8795 *24

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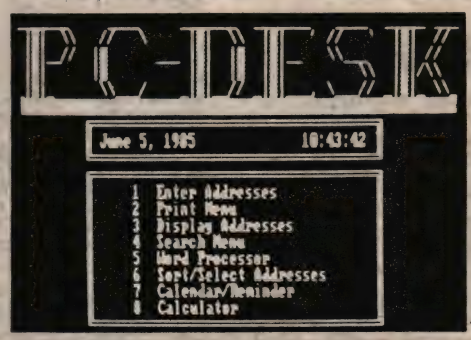
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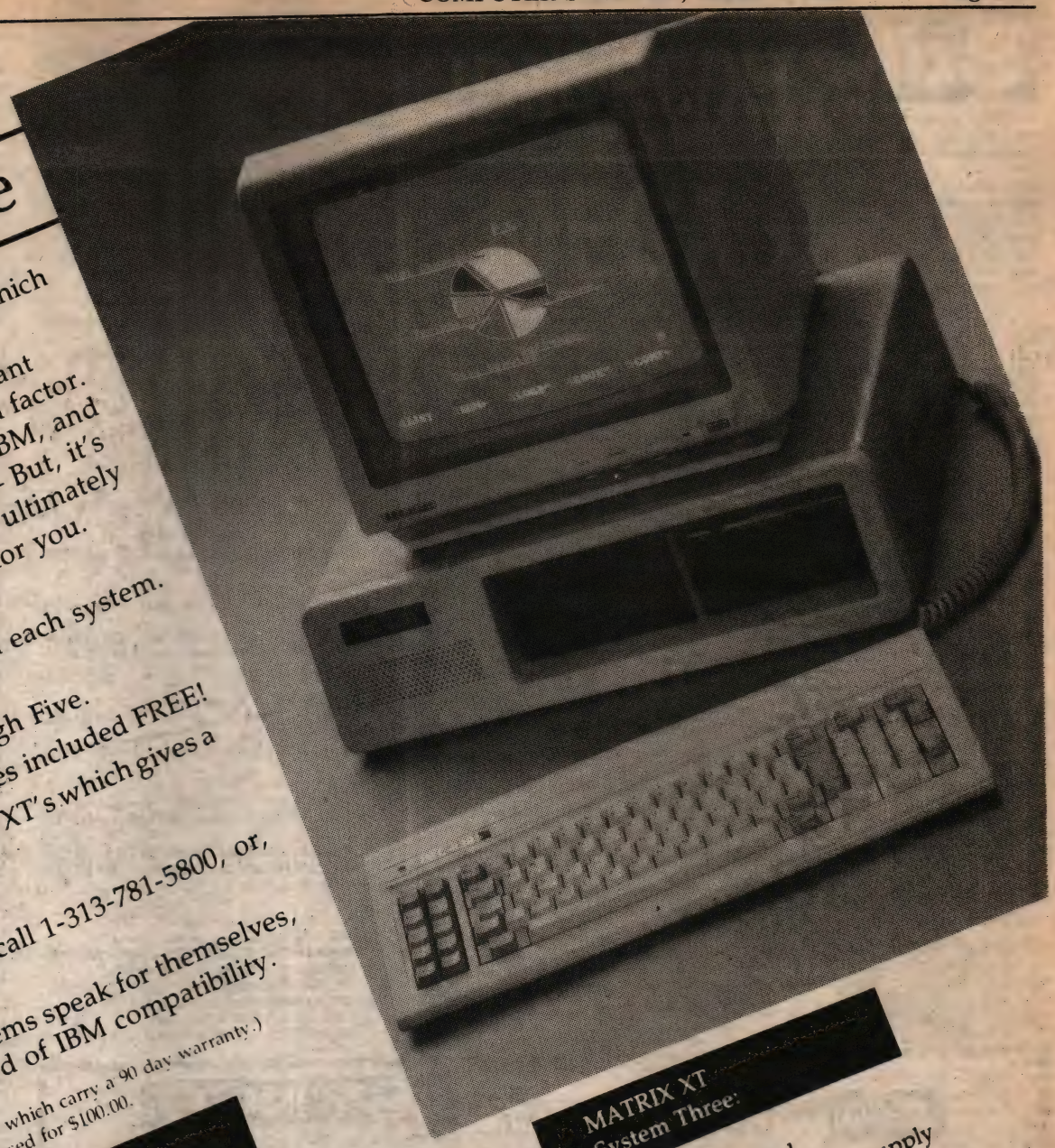
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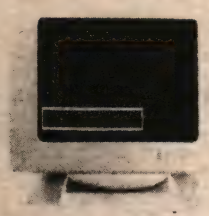
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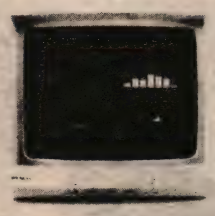
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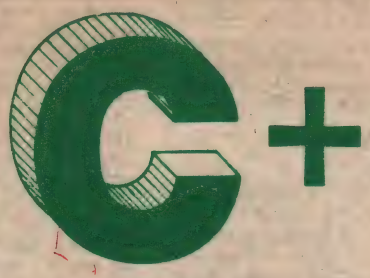


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asm	conc	ferror	getdseg	iscntrl	open	repmem	strcmp
asmx	cos	fflush	getd	isdigit	outp	rewind	strcpy
atan	cpystr	fgets	putd	islower	peek	right$	strlen
atof	creat	fileno	getdate	isprint	perror	rindex	strncat
atoi	cursblk	filetrap	gettime	ispunct	poke	rmdir	strncmp
atol	curslin	find	geti	isspace	poscurs	scanf	strncpy
bdos	curscol	floor	puti	isupper	pow	setbuf	strsave
bdosx	cursrow	fopen	getkey	itoa	printf	setbufsiz	system
bios	cursoff	fprintf	getmode	keypress	putc	setcolor	tolower
biosx	curson	fputs	setmode	left$	putchar	setdate	toupper
calloc	delete	fread	gets	len	puts	settime	ungetc
ceil	drand	free	getw	log	putw	setjmp	ungetch
cfree	exec	freopen	heapsiz	log10	rand	setmem	unlink
chain	execl	fscanf	heaptrap	longjmp	read	sin	write
character	execv	fseek	hypot	lseek	readattr	sound	writechs
chdir	exit	ftell	index	malloc	reach	sprintf	xmembeg
chmod	exitmsg	fwrite	inp	alloc	writech	sqrt	xmemend
clearerr	exp	getc	insert	mathtrap	readdot	srand	xmemget
close	fabs	getch	iofilter	mid$	writedot	sscanf	xmemput
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Coming Events

If you know of or have a trade show, swap meet or club meeting connected with the computer field, we'll run an announcement in the COMING EVENTS section FREE of charge.

FEBRUARY

FEBRUARY 11-13
AUDITING PROCEDURES FOR NCR FINANCIAL APPLICATIONS, in Chicago, teaches and reviews effective audit techniques used on all computer systems. Handbook of Guidelines and Audit Work Programs for your business, General Controls, Applications Controls, G/L, A/P, A/R, and Payroll Reviews. For additional information, contact T.J. Enterprises, P.O. Box 255, Chicago Ridge, Illinois 60415-0255; (312) 839-2611.

FEBRUARY 28-MARCH 2
STRIDE FAIRE '86, in Reno Nevada, The Faire will focus on hardware and software developments in that area. Speakers and seminars will address topics form 68020 chip development to the newest language and operating systems available. For additional information contact Stride, P.O. Box 30016, Reno, NV 89520-0016; (702) 322-6868.

MARCH

MARCH 2, 1986
ROCKLAND COUNTY COMPUTER FAIRE will be held at Holiday Inn in Suffern, NY. The Holiday Inn is located on New York Thruway at exit 14B. There will be 90 tables, computers, software, etc. Admission is $3.00, Tables are $35.00. Show is open to public from 10am to 4pm. For additional information contact (201) 533-1991

MARCH 3-6
FIRST INTERNATIONAL CONFERENCE ON CD ROM, at the Sheraton Hotel, Seattle, WA., discussing how CD ROM will affect traditional print-based publishing, business productivity software, business computer systems, and home and entertainment systems. Will incorporate invited presentations from leading and influential authorities and experts, key equipment suppliers, publishers, and experienced users. Cost for attending is $799 until February 1; the cost will then be $899. All papers should be submitted by January 6 to Min S. Yee, Conference Chairman, Microsoft Corporation, 10700 Northup Way, Box 97200, Bellevue, WA 98009.

MARCH 3-6, 1986
SECOND ANNUAL COMDEX IN JAPAN will be held in Tokyo. The Asian edition of the world's largest computer industry trade show will be held at the Harumi Exhibition Center. More than 200 leading companies from Japan, other Asian countries and the U.S. are expected to display and demonstrate new computer systems, peripherals, software, media, supplies, services, accessories and other related items. For further information contact The Interface Group, Inc., 300 First Avenue, Needham, Massachusetts, 02194, (617)449-6600.

MARCH 10-11, 1986
USING LOTUS 1-2-3 is to be held in Orlando, Florida at the Las Palmas Hotel. The Las Palmas Hotel is located at 6233 International Drive, Orlando, FL 32809. For additional information call (305) 351-3900.

MARCH 10-11, 1986
THIRD ANNUAL NATIONAL CONFERENCE ON TECHNOLOGY AND EDUCATION will be held in Fort Worth, Texas. The conference will be pinpointed on curriculum and software. Panels will delve into such topics as the new technology, manintaining instructional integrity with quality software products on the market for educational uses. Other breakout sessions will involve special education, telecommunications, use of computers in the home and in business schools. For additional information contact National Conference on Technology and Education, 1400 One Tandy Center, Fort Worth, TX 76102

MARCH 11-13, 1986
12th ANNUAL FEDERAL DP AND COMMUNICATIONS is to be held in Washington at the DC Convention Center. Geared to the special requirements of Federal data processing professionals. More than 200 leading manufacturers and suppliers are expected to display and demonstrate computer systems, data communications and communications equipment, office automation systems, software, timesharing, network services and related equipment. For further information contact The Interface Group, Inc., 300 First Avenue, Needham, Massachusetts 02194, (617)449-6600

MARCH 11-13
AUDITING ON-LINE HEALTHCARE ORDER ENTRY AND UB-82, in Chicago, teaches and reviews effective audit techniques used in all Healthcare Computer Systems. Handbook of Guidelines and techniques to audit on-line ordery entry and determine compliance with UB-82. For additional information contact T.J. Enterprises, P.O. Box 255, Chicago Ridge, Illinois 60415-0255; (312) 839-2611

MARCH 16, 1985
AMATEUR RADIO/COMPUTER FLEA MARKET will be held at The American School for the Deaf in West Hartford, CT. Talk-in will be on 146.28/88. Doors open at 9AM until 3PM. Tables $10.00, call early to reserve in advance. Contact Chuck Motes, K1DFS 22 Woodside Lane Plainville, CT 06062 or (203) 747-6377 evenings.

MARCH 19-21
PERSONAL COMPUTER INTERFACING WORKSHOP for Scientific Instrument Automation, from Virginia Tech; held in Blacksburg, Va.; directed by Mr. David E. Larsen and Dr. Paul E. Field. $495. 3 days. Hands-on workshops with each participant wiring and testing interfaces on the IBM-PC and other personal computers. Call or write Dr. Linda Leffel, C.E.C., Virginia Tech, Blacksburg, VA 24061, (703) 961-4848.

MARCH 23-26, 1986
THE FIFTEENTH INTERNATIONAL TI-MIX CONFERENCE AND TRADE SHOW, "Achieving Your Potential" will be held at the Lowes Anatole Hotel in Dallas, Texas. It focuses on the powerful vehicle that TI-MIX provides for users: how to take full advantage of Texas Instruments computers and peripherals. For further information contact TI-MIX, M/S 2200 CC052, PO Box 2909, Austin, Texas 78769

MARCH 24-27, 1986
14th ANNUAL INTERFACE '86 Conference and Exposition will be held at the Georgia World Congress Center in Atlanta, GA. More than 300 companies are expected to display and demonstrate computer systems and communications services for large-scale corporate, government and institutional users. For further information contact The Interface Group, 300 First Avenue, Needham, Massachusetts 02194

MARCH 26-27, 1986
THE LOTUS DEVELOPER CONFERENCE will be held at the Hyatt Regency Hotel in Cambridge, MA. The Lotus Developer Conference is a forum where developers can meet with industry experts and Lotus personnel to share ideas and expertise, and hear about: state of the art technologies, tips/techniques for successful applications development, Lotus news and 1986 strategies, and much more. For additional information contact Mark Scapicchio at Lotus (617) 577-8500 x 8226.

APRIL

APRIL 1-3, 1986
THIRD ANNUAL COMDEX/WINTER
The winter edition of the world's largest computer industry trade show, will be held at the Los Angeles Convention Center. More than 200 leading companies are expected to display and demonstrate new computer systems, peripherals, software, media and supplies, services, accessories and other related items. For further information contact The Interface Group, Inc., 300 First Avenue, Needham, Massachusetts 02194, (617)449-6600

APRIL 3-6, 1986
THE WEST COAST COMPUTER FAIRE is the longest running and largest computer user show in the nation. Located in San Francisco, the center of the computer industry. The 11th West Coast Computer Faire targets business, professional, and home users, as well as resellers and independent software developers. The latest in microcomputer hardware, software, peripherals and services will be showcased. A comprehensive conference program is included in the price of admission. For more information contact Computer Faire, Inc. (617) 965-8350

APRIL 6, 1986
1986 GREATER BALTIMORE HAMBOREE AND COMPUTERFEST will be held at the Maryland State Fairgrounds in Timonium, MD. This is the largest multi-interest personal comptuer, small business computer, electronics show, and flea market in the Mid-Atlantic area. The Computerfest will be open from 8am to 4pm. Admission is $4.00. For additional information contact: G B H & C, P.O. Box 95, Timonium, MD 21093-0095; (301) 561-1282

APRIL 6-10, 1986
1986 SPRING CONFERENCE - REACHING FOR EXCELLENCE will be held at the Sheraton Centre Hotel in New York, NY. Over 380 presentations are being planned, not only covering the various systems present within the membership, but management and application topics as well. The schedule is designed to provide attendees the latest "state of the art" information and techniques. Presenters are not only users but IBM technical personnel as well. For additional information contact COMMON, 435 N. Michigan Ave., Ste. 1717, Chicago, IL 60611; (312) 644-0828

April 7-10, 1986
ANNUAL CONVENTION AND TECHNOLOGY EXPOSITION, at Diplomat Hotel, Hollywood, Florida. This convention will feature four days of technical sessions of importance to design/drafting management. For additional information contact American Institute for Design and Drafting, 966 Hungerford Drive, Suite 10-B, Rockville, MD 20850; (301) 294-8712.

APRIL 12, 1986
NY-NY TIMARC will be hosted by the QB-99'ers User Group at Queensborough Community College, Bayside, NY. The conference will start at 1 pm and continue until 6pm. Tutorials on hardware and software development and maintenance will take place from 2 to 5pm. For additional information contact Mr. Frank Cotty, Queensborough Community College, 56th Ave. & Springfield Blvd., Bayside, NY 11364

APRIL 12 & 13
FORT WORTH COMPUTER SHOW, at Amaon G. Carter Exhibit Hall Crestline Road, between Montogomery & University Drive, 250 8" tables. For additional information contact Bob Norman, P.O. Box 9504, Ft. Worth, TX 76107

APRIL 15-17
ROBBERY WITHOUT A GUN--DETECTION, PREVENTION, PROTECTION, in Chicago, teaches and reviews effective audit techniques used in the detection, prevention and protection of internal and external data security. You will be equipped with a *Handbook of Guidelines*, techniques and procedures to combat against "Robbery Without A ¼ Gun." For additional information contact T.J. Enterprises, P.O. Box 255, Chicago Ridge, IL 60415-0255; (312) 839-2611.

APRIL 16-17, 1986
THE 13TH ANNUAL NEBRASKA INFORMATION PROCESSING EXPO & CONFERENCE will be held at the Holiday Inn Convention Center in Omaha, Nebraska. For additional information contact Industrial Presentations West, Inc., 12371 East Cornell Avenue, Aurora, Colorado 80014

APRIL 26-27, 1986
COMMODORE ASSOCIATION OF THE SOUTHEAST, INC. ANNUAL MEETING will be held at the Opry Land Hotel in Nashville, TN. For additional information contact Commodore Association of the Southeast, Inc., P.O. Box 110386, Nashville, TN 37222

APRIL 27, 1986
COMPUTER CENTRAL SHOW will be held at the Holiday Inn in Itasca, IL. For additional information call (312) 940-7547

MAY

MAY 11-14, 1986
1986 ANNUAL SYSTEMS CONFERENCE will be held in New Orleans. This conference is going to focus on what the world of information systems is going to be like in 2,000 A.D. The Conference's educational format will be bolstered by other noted speakers on a variety of information systems topics. Complete details on the 1986 Conference may be obtained by contacting Richard B. McCaffrey, ASM International, 24587 Bagley Road, Cleveland, OH 44138

MAY 14-16, 1986
THE 9TH ANNUAL ROCKY MOUNTAIN INFORMATION EXPO & CONFERENCE will be held at Currigan Hall, Denver, Colorado. For additional information contact Industrial Presentations West, Inc., 12371 East Cornell Avenue, Aurora, Colorado 80014; (303) 696-6100

May 29-31, 1986
PERSONAL COMPUTER INTERFACING WORKSHOP for Scientific Instrument Automation, from Virginia Tech; held in Blacksburg, Va.; directed by Mr. David E. Larsen and Dr. Paul E. Field. $495. 3 days. Hand-on workshops with each participant wiring and testing interfaces on the IBM-PC and other personal computers. Call or write Dr. Linda Leffel, C.E.C., Virginia Tech, Blacksburg, VA 24061, (703) 961-4848.

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SEPTEMBER

SEPTEMBER 18-19, 1986
COMDA/CANDAX, at Palais des Congres Montreal Convention Centre, Montreal, Canada. For additional information contact Candex Conferences Inc. 47 Lakeshore Road East, Mississauga, Ontario L5G 4L7; (416) 271-1601.

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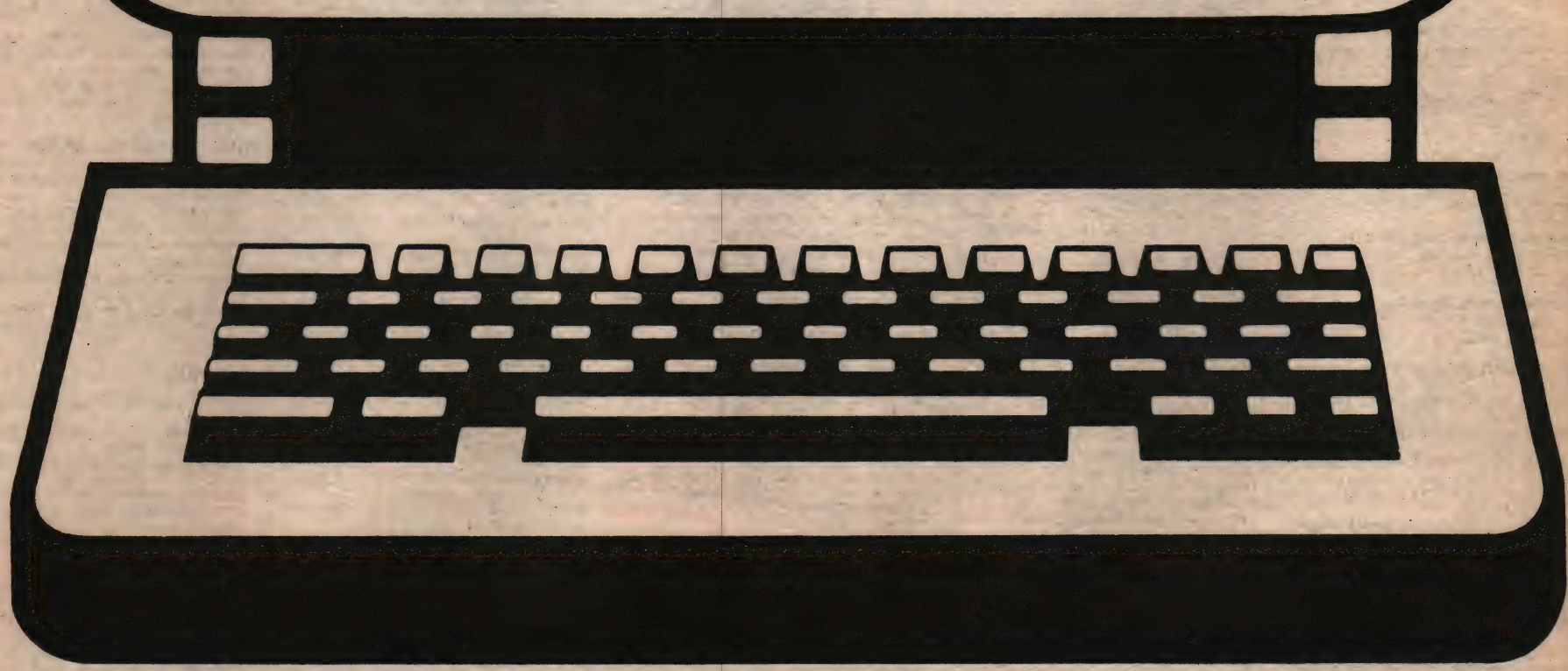
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NOTE: *Computer Shopper* lists User Groups as a free service to readers and to the clubs. We are not responsible for errors in these listings published. Changes to this list are once a month. If you send us a correction on a listing, we will publish it in the first available issue.

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SOFTWARE SOURCE, 3262 SPRINGDALE MALL. MOBILE. AL 36606
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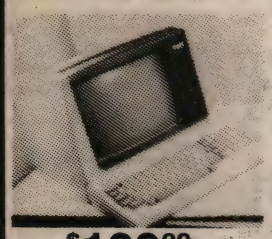
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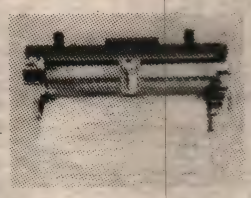
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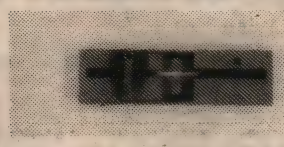
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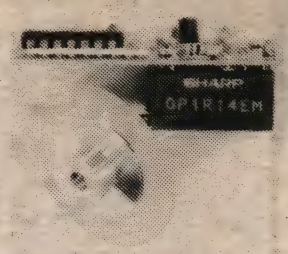
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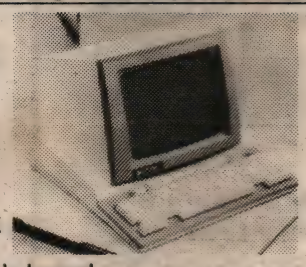


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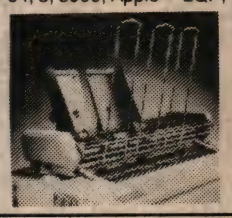
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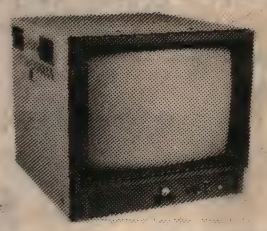
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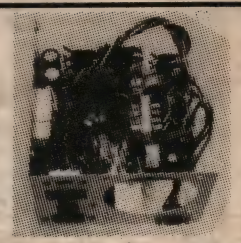
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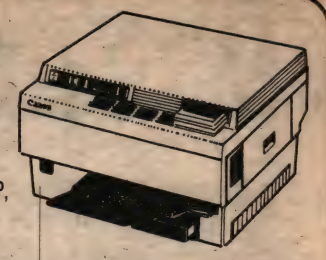
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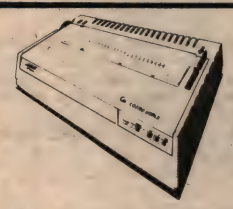
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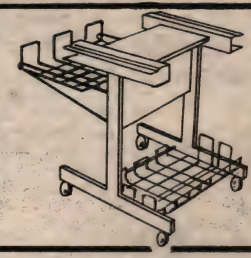
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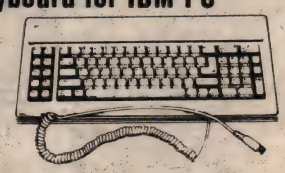
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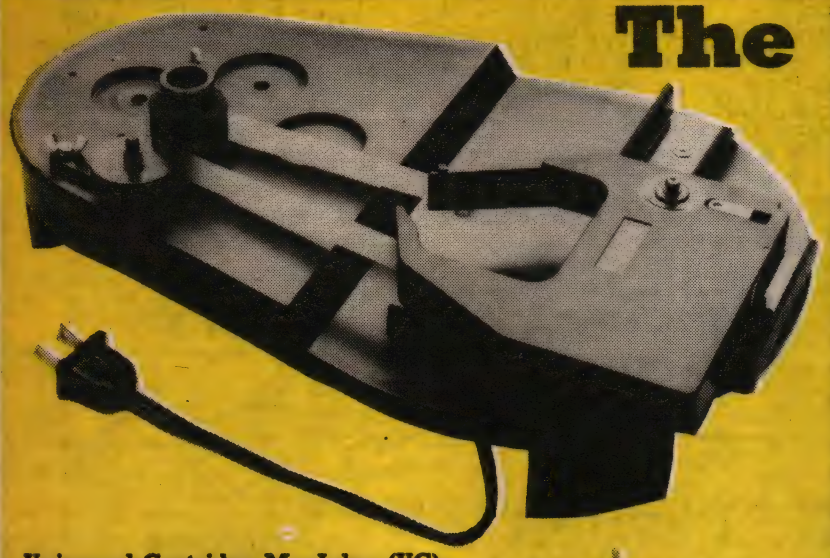
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ADAM & EVE APPLE USERS' GROUP, P.O. BOX 5344. MADISON. WI 53705
COMAL USERS GROUP, 5501 GROVELAND TERRACE. MADISON. WI 53716
DURANT COMPUTER CLUB, 901 S. 12TH STREET. WATERTOWN. WI 53094
THE EAU CLAIRE ATARI USERS GROUP, 1406½ MAPPA ST.. EAU CLAIRE. WI 54701
EAU CLAIRE ATARI VALLEY CHIPPEWA ATARI USERS GROUP, C/O MORT SIPRESS. 1735 COOLIDGE COURT. EAU CLAIR. WI 54701
FOND DU LAC COMPUTER CLUB (TI), C/O BRUCE MURRAY. PO BOX 1031. FOND DU LAC. WI 54935
FOX CITIES USERS GROUP (TI), ATTN. DAN KEATING. PO BOX 2277. APPLETON. WI 54913
FRANKLIN/APPLE INFORMATION X-CHANGE (FIX) C/O G. PILAK. 2832 S. HERMAN STREET. MILWAUKEE. WI 53207
G&L ELECTRONICS TI USERS GROUP, C/O GENE OLIG. ROUTE 3 FOND DU LAC. WI 54935
GREEN BAY 99ERS, C/O JOHN VANDERMUS. 124 S. IRWIN AVE.. GREEN BAY. WI 54301
MADAREA 99ERS, C/O MARCIA SCHMIDT. 2118 HIGH RIDGE TRAIL. NO. 302. MADISON. WI 53713
MADISON COMPUTER SOCIETY, C/O J.SCRENK. 3102 ASHFORD LN.. MADISON. WI 53713
MENOMIN APPLE USERS GROUP, ALLEN KELSEY. SOFTWARE LIBRARIAN. 802 12TH AVE. E.. MENOMONIE 54751
MIDWEST INTERACTIVE COMPUTER, RESOURCE ORGANIZATION (MICRO), 34 PLEASANTVILLE CT.. APPLETON. WI 54911
MILWAUKEE AREA 99ER, C/O JIM VINCENT. 2007 NORTH 71ST STREET. WAUWATOSA. WI 53213
MILWAUKEE AREA COMPUTER, TECH. INST.. PEWAUKEE. WI 53072
MILWAUKEE AREA USERS GROUP, 2007 N. 71st ST.. MILWAUKEE. WI 53213
ROCK 99 COMPUTER CLUB, C/O TOM SEWALL. N. 2425 CHAPEL DR.. WHITEWATER. WI 53190
SHEBOYGAN AREA USERS GROUP (TI), C/O AL FISCHER. 3431 N. 10TH. NO.302. SHEBOYGAN. WI 53081
SINCLAIR MILWAUKEE USERS GROUP, P.O. BOX 101. BULTER. WI 53087
TI 99/4ALL USERS GROUP, C/O BOB ANDERSON. 1008 MAIN ST.. EAU CLAIRE. WI 54703
TRS-80 UG MADISON, 201 W. MIFFLIN. MADISON. WI 53703
WISCONSIN 99ER COMPUTER COUNCIL, C/O BRUCE MURRAY. PO BOX 1031. FOND DU LAC. WI 54935
WISCONSIN APPLE USERS CLUB C/O JIM SHAPIRO. P.O. BOX 0507B. MILWAUKEE. WI 53205

WYOMING

ADAMLAND, ADAM USERS GROUP, 795 GARFIELD. LANDER. WYOMING. 02520
THE APPLE NET, 2203 PARK AVE.. ORCHARD VALLEY. CHEYENNE. WY 82007

AUSTRALIA

THE BLUE MOUNTAINS HOMEBREW COMPUTER CLUB, C/O ERIC LINDSAY. 6 HILLCREST AVE.. FAULCONBRIDGE NSW 2776. AUSTRALIA. 047-512258
KAOS, C/O DAVID ANNEAR. 49 MILLEWA CRES.. DALLAS VIC 3047
OMEGA, C/O GEOFF COHEN. 72 SPOFFORTH ST.. HOLT. ACT 2615
T.I.S.H.U.G., PO BOX 595. MARRICKVILLE. N.S.W. 2204
TASMANIAN USERS GROUP, C/O DAVID TASVER. 111 BASS HWY.. WESTBURY TAS 7303
TI USERS GROUP IN MELBOURNE, 59 LANDSTROM QADRANT. KILSYTH. VICTORIA 3137
TEXPAC-BBS, MARRICKVILLE. AUSTRALIA. 61-2-5690949.

ENGLAND

CHURCH COMPUTER USERS' GROUP, C/O REVEREND R.S. WILSON. GREENSIDE VICARAGE. RYTON. TYNE AND WEAR. ENGLAND

CANADA

BRITISH COLUMBIA

THE INTERNATIONAL C64 USERS GROUP, 22559 HINCH CRES. MAPLE RIDGE. BC CANADA V2X 7H5
ISLAND APPLES USER GROUP, 567 MEADOWBROOK AVE.. CAMPBELL RIVER. BRITISH COLUMBIA CANADA. V9W 5M3
OKANAGAN QL USERS GROUP, C/O RR2. SITE 79. BOX 10 SUMMERLAND. B.C. CANADA. V0H 1Z0
VANCOUVER SINCLAIR USER GROUP, P.O. BOX 788. NEW WESTMINSTER. B.C.. CANADA V3L4Z8

ALBERTA

CALGARY TIMEX SINCLAIR USERS GROUP (CTSUG), BOX 201 STN G. CALGARY. ALBERTA. CANADA T3A 2G2
CANADIAN COMMODORE COMPUTER CLUB C/O STRICTLY COMMODORE 47 COACHWOOD PLACE NORTHWEST CALGARY. ALBERTA. CANADA T3H 1E1

SASKATCHEWAN

SASKATOON TEXAS INSTRUMENTS COMPUTER CLUB 407-2010 22nd STREET W., SASKATOON, SASK. (306) 978-0182

MANITOBA

WINNIPEG 99/4A USERS GROUP, 1105 CHURCH AVENUE. WINNIPEG. MANITOBA CANADA R2X-1G1

ONTARIO

APPLE USERS GROUP OFF MUI C/O BERT WILLIAMS. 47 TUCKET ST.. SAULT STE. MARIE. ONTARIO P6A 4G8 (SEE ALSO SAULT STE. MARIE. Mich.)
CHANNEL 99'ER USERS GROUP WENTWORTH SUPPLIES. P.O. BOX 1005. STATION "A". HAMILTON. ONTARIO. L8N 3R1
I.E.E.E., STUDENT BRANCH, COMPUTER CHAPTER, C/O E.E. DEPARTMENT. UNIVERSITY OF WATERLOO WATERLOO. ONTARIO N2L 3G1
LOGIC PO BOX 696. POSTAL STATION "B". WILLOWDALE. ONTARIO. M2K 2P9. 416-881-8120
NINE T NINE USERS GROUP 55 CORDELLA AVENUE. TORONTO. ONTARIO M6N 2J7
TILT C/O G.H. FORDER. 93 SCOTT STREET. TRENTON. ONTARIO. K8V 3B5. 613-392-7935
TORONTO "OHIO SCIENTIFIC" IDEAS EXCHANGE. P.O. BOX 29. STREETSVILLE. ONTARIO. L5M 2B7
TORONTO TIMEX-SINCLAIR USERS CLUB, P.O. BOX 7274. STN. A. TORONTO. ONTARIO M5W 1X9
TPUG (TORONTO PET USERS GROUP) 3 CLARET COURT. ISLINGTON. TORONTO. ONTARIO M9A 456

QUEBEC

CLUB TIPS, 11680 ST-REAL. MONTREAL. QUEBEC. CANADA H3M 2Y4
MICRO ORDINATEUR MILLE-ILES 673 CLAIRETTE FABREVILLE. LAVAL. QUEBEC. H7P 2Y3
MONTREAL TRS-80 USERS' GROUP 1176 PHILLIPS PLACE SUITE 021. MONTREAL. QUEBEC H38 3C8
QUEBEC ASSOCIATION DES UTILISATEURS D'ORDINATEURS DU QUEBEC C.P. 685. SUCC. "H". MONTREAL. QUEBEC H3G 2M6
QUEBEC/CANADA ASSOCIATION DES UTILISATEURS D'ORDINATEURS DU QUEBEC, C.P. 122. SUCC. "F". MONTREAL QUEBEC. H3J 2K8
SHER-TI 422 7th AVENUE SOUTH. SHERBROOKE. QUEBEC. CANADA J1G 2N2
SMUG OF MONTREAL, 443 boul. Roche. Vaudreuil. Quebec. Canada J7V 2N4

NEW BRUNSWICK

FUNDY C-64 USERS GROUP, P.O. BOX 9. ROTHESAY NEW BRUNSWICK CANADA E0G 2W0
MONCTON ATARI COMPUTER USERS, C/O MURRAY STEEVES. 39 DAWN CRES.. MONCTON. N.B.. CANADA E1O 1K9
TI USERS GROUP OF SOUTHEASTERN NEW BRUNSWICK, 139 DUFFERIN STREET. MONCTON. NEW BRUNSWICK. CANADA E1C 1Z2

PRINCE EDWARD ISLAND

NOVA SCOTIA

T.I.N.S. C/O 321 IONY HILL LN. SACKVILLE. NOVA SCOTIA B4E 1M6

NEW FOUNDLAND

GERMANY

PATCH TI 99ER USER GROUP, P.O. BOX 1068. APO NY. NY 09128. LOCATED IN STUTTGART. GERMANY
CP/M OSBORNE KAYPRO EXCHANGE IN USERS GROUP (COKE/UG) C/O LAWRENCE C. YARNALL. Jr.. HINTERGASSE 4. 6719 TIEFENTHAL/W. GERMANY
SENECASOFT, C/O DIETER ECKHARDT. RUCKERSTSREET 1. 4100 DUISBURG 14. W. GERMANY

MEXICO

MICROCOMPUTER CLUB, C/O ALFREDO BOZALI. FTE. DE QUIJOTE #5. MEXICO. IO. D.F.

PUERTO RICO

COMMODORE USER'S GROUP OF PUERTO RICO, CALLE 16 35-24 VILLA CAROLINA. CAROLINA. PR 00630 (809)762-2422
THE VIC-20 USER'S GROUP, C/O ROBERTO MORALES. JR.. 655 HERNANDEX ST.. MIRAMAR. PUERTO RICO 00907

SPAIN

EUROPEAN APPLESHARE, c/o CNOGB. CHRIS STONE. TORRE DE MADRID. PLANTA 7. OFICINA 14. C/PRINCESA 1. MADRID. SPAIN 28008

TRINIDAD

TRINIDAD ASSOCIATION OF COMMODORE OWNERS (TACO), C/O BRENT MUNDY. 118 MEADOW DR.. ORANGE GROVE. TACARIGUA. TRINIDAD

MTBASIC

Multitasking BASIC Compiler

	Windowing	Multitasking	ROMable code	Recursive	Price	8087 support	Multi-line functions
MTBASIC	**Y**	**Y**	**Y**	**Y**	**$49.95**	**optional**	**Y**
MBASIC	n	n	n	n	$350.00	n	n
TURBO PASCAL	IBM only	n	n	Y	$69.95	optional	Y
CBASIC2	n	n	n	n	$600.00	n	n
BASCOM	n	n	n	n	$395.00	n	n

MTBASIC, the multitasking Basic compiler, has everything you need!

Interactive Compiler

MTBASIC is an interactive compiler and a unique Basic language. MTBASIC is easy to use since you can write programs in an interactive environment and them compile them using only one command. MTBASIC is easy to learn because it is similar to many other Basics. The biggest advantage of using a compiled Basic is FAST PROGRAMS. With MTBASIC you get speed and advanced features.

Features

Multitasking
Windowing
Interactive
Compiles in seconds
Multi-line functions
No runtime fee
Handles interrupts
Fast native code
ROMable code
Formatted I/O
Assembly language calls
In-line machine code

Complete Package

The MTBASIC package includes all the necessary software to run in interpreter or compiler mode, an installation program (so any system can use windows), demonstration programs, and a comprehensive manual.

Ordering

MTBASIC is available for CP/M, MS-DOS, and PC-DOS systems for $49.95. MTBASIC with 8087 support is available for MS-DOS for $79.95. Shipping is $3.50 ($10.00 overseas). MD residents add 5% sales tax. MC, Visa, checks and COD accepted.

SOFTAID, Inc. P.O. Box 2412 Columbia, MD 21045-1412 301/792-8096

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SOFTWARE SHOPPING LIST

NAME: DATABASE ACCOUNTING
TYPE: Accounting Software
COMPUTER: IBM PC family and compatibles and any other microcomputers supporting dBASE, including CP/M, UNIX and multiuser systems.
DESCRIPTION: This program is an interactive accounting system consisting of a general ledger, accounts receivable, accounts payable, order entry, sales invoicing/analysis purchase orders, budgeting, payroll, inventory and return material authorization. The program handles up to 10 divisions or profit centers, with 99 departments per division. Database Accounting provides 200 standard reports. Custom reports are easily generated through dBASE.
PUBLISHER: PC Wizards, Inc., 1626 Newell Avenue, Walnut Creek, CA 94596; (415) 945-0402
COST: Database Accounting is available to dealers at no cost for a 30-day evaluation period. The one-time site license fee is $8,000. In addition, personalaized manuals and slip covers are available for $175 per complete set.

NAME: RACE THE CLOCK
TYPE: Educational Matching Program
COMPUTER: IBM PC/PCjr; Apple II Series
DESCRIPTION: Race The Clock is a matching program that uses the animation capabilities of the computer to teach verbs. A grid with 12, 20 or 30 squares appears on the screen. The player sharpens memory skills by choosing two squares at a time to find a match. Each correct answer is rewarded with music. To win, the player uncovers all the matches before time runs out. A menu is available to choose the type of matching game. A special feature allows teachers to author their own lessons. In addition, playing time may be adjusted or turned off to meet individual needs.
PUBLISHER: Methods & Solutions, Inc., 82 Montvale Avenue, Stoneham, MA 02180; (617) 438-5454
COST: $39.99

NAME: R/DOC-X
TYPE: Document Conversion Program
COMPUTER: MS-DOS, PC-DOS, CP/M-86 or CP/M-80 Based Computer
DESCRIPTION: This conversion program can read files created by one (source) word processing program, and convert them to files readable by a different (destination) word processing program. Formatting and print enhancement instructions or codes (such as soft returns, centering, indenting, bold-facing, underlining and italicizing) are correctly translated so that subsequent document editing under the destination program is eliminated or minimized. Formats of most commonly used word processing programs are supported. The software is menu-driven and requires almost no learning. It is modular, so the user need not purchase formats that he does not require, or may purchase them at a later date. It is available in any 8", 5¼" or 3½" disk format.
PUBLISHER: Compu-Draw, 1227 Goler House, Rochester, NY 14620; (716) 454-3188
COST: $95 plus $35 for each format purchased

NAME: UNIT CONVERSIONS
TYPE: Technical Software
COMPUTER: IBM PC, AT, XT; Apple IIe, IIc, II +
DESCRIPTION: This program is useful for engineers, scientists, surveyors, architects, purchasing agents, technicians, chemists, researchers, students, teachers, realtors, technical writers, or anyone else who uses a microcomputer and who requires regular or occasional references to measurement conversions. This program performs 3,550 measurement conversions within 22 different families of units. Results are displayed in decimal and scientific notation. Accuracy is five significant digits. Results are rounded rather than truncated. The program is virtually self-documenting. The program runs in machine language with rapid conversion time. The operating program is copiable. The program is menu and command driven for ease-of-use and immediate feedback of results. An input mask and traps reduce key stroke error, and more!
PUBLISHER: International Computing, Inc., 1501 Monroe Street, Madison, WI 53711; (608) 257-6648
COST: $49.95

NAME: SCREEN-WARE UTILITIES
TYPE: Universal Screen Creation Program
COMPUTER: IBM PC/XT/AT/compatibles (128K)--any color or monochrome display/driver
DESCRIPTION: Create professional-looking screens or modify existing ones easily and take full advantage of colors, attributes, and extended graphic character set. Incorporate the screens into your 8088/8086 assembly programs or routines called by any high level language. An ASCII source file (.asm) is automatically generated, which can be assembled and linked directly into a program without ANY additional programming. Source file generates all necessary assembler requirements and also contains commented line numbers if you want to modify or extract a portion of it with a word processor. With our memory resident "SNAP-SHOT" utility, you can grab a screen created by any program, custom tailor it, and use it in another program. "CHARMAP" and ATTRI-MAP" utilities provide reference charts for character mapping, useful in screen interactive programs. Manual, examples, plus more.
PUBLISHER: Crosswinds Software, 8621 Windjammer Drive, Raleigh, NC 27609; (919) 847-1812
COST: $49.00

NAME: KEYENTRY III
TYPE: Data Entry Software System
COMPUTER: IBM PC and compatible
DESCRIPTION: KeyEntry III is a comprehensive all-purpose PC-based software data entry system with complete entry, validation, searching, editing and verification capabilities. It includes two basic modes of operation; one for "heads down" high speed production data entry, and the other for "heads up" phone order and casual data entry.
PUBLISHER: Southern Computer Systems, Inc., 2732 Seventh Ave. South, Birmingham, AL 35233; (205) 251-2985
COST: Not provided

NAME: FREEWORD
TYPE: User Supported Word Processor and Spelling Checker
COMPUTER: IBM PC, PC-XT, PC-Portable, or PC-AT
DESCRIPTION: This program is a menu driven word processor. This means that there are not a lot of commands that you must learn before you can use this program. Many people will be able to use the program without reading the manual or working through the tutorial. There is also an online help service available from the Main Menu. The features of Freeword include: Online help; menu driven for easy learning and use; supports sub-directories; not copy protected; displays sorted directory; supports all PC parallel printers; will print multiple copies; allows you to select the page to print; edit current document or any other document while printing; typewriter mode for addressing envelope, filling out forms, or sending special print codes to the printer; left and right justification; move cursor by character, word, line, screen or page, easy to use find, and find & replace; block commands to copy, move and delete a block; free spelling checker to registered users.
PUBLISHER: Stilwell Software Products, 16403 N. 43rd Drive, Glendale, AZ 85306; (602) 978-4678
COST: Registered owner (program, printed manual and spelling checker)--$49; program and documentation on a diskette--$10

NAME: DYNO-QUEST
TYPE: Educational Progam
COMPUTER: IBM PC/PCjr; Apple II series
DESCRIPTION: What did happen to those dinosaurs? Set back in the Age of Dinosaurs, This MindPlay game has been released for use in the classroom, Grades 2 to 8. An adventure that takes players back in time to the Triassic, Jurassic and Cretaceous eras, this game encourages students to analyze and organize facts about dinosaurs. The new Challenge Upgrade Menu may be used to select specific dinosaurs or customize game play. The Teacher's Guide includes additional activites, maps and fact sheets for student use.
PUBLISHER: Methods & Solutions, Inc., 82 Montvale Avenue, Stoneham, MA 02180; (617) 438-5454
COST: $39.99

NAME: SED
TYPE: Screen Editor
COMPUTER: IBM/MS-DOS machines
DESCRIPTION: Edits any file. Useful for writing programs or editing non-text files. Has key macros, search & replace with options, block commmands (including block print), jumplables, undelete, restore line, scroll, more. Can view data files, fix skewed pointer files, patch .EXE program files. Also design screen templates or windows using IBM's extended ASCII characters. Easy to use and fast.
PUBLISHER: DISC - Data Integration Services Corporation, 1725 K Street NW, Suite 611, Washington, DC 20006; (202) 785-8585
COST: $19.00

Continued On Next Page

NAME: SPELLBOUND
TYPE: Educational Program
COMPUTER: Apple II, Commodore 64, TRS-80 Model III/4, and TI99/4A
DESCRIPTION: This program has been designed to significantly improve spelling skills when used either at home or in the classroom. Spellbound is easy to use by the student and parent/teacher, and allows the teacher to select the spelling words (100 maximum) and the difficulty factor. It supplies spelling practice, scoring and reinforcement activity. This program is a simple, enjoyable and inexpensive way to use personal computers to improve spelling skills.
PUBLISHER: Robinsoft, 152 W. 4th, P.O. Box 666, Prineville, Oregon 97754
COST: $14.95

NAME: BIO*CELL
TYPE: Biology Program
COMPUTER: IBM PC/XT/jr/AT, and Apple II + /IIe/IIc
DESCRIPTION: This program presents an introduction to the biology of cells. The major cell structures for plants and animals are illustrated and the function of each organelle is explained. A survey of the various types of cells that make up plants and animals is provided. The material is suitable for anyone 7th grade and up who is interested in biology, to use at home or in the classroom. The program is easy to use with a main menu to select activities and you can proceed at your own pace of learning. The material is well organized to use for review after initial learning is complete.
PUBLISHER: Zephyr Services, 306 S. Homewood Ave., Pittsburgh, PA 15208; (412) 247-5915
COST: $29.95 + $2.00 shipping

NAME: DOODLES
TYPE: Educational Software
COMPUTER: IBM PC
DESCRIPTION: This alphabet learning program comes packaged in a Jack-In-The-Box style housing with a bright yellow floppy disk. The program is operated by hitting random keys and the space bar. When a "letter" key is hit, a sequence of screens display the letter, a corresponding animated picture, and the proper spelling of the word depicted by the picture. This program was designed to be error free, meaning young children can be left alone at the keyboard and will not have play terminated accidentally.
PUBLISHER: Story Book Software; (213) 390-7781
COST: $19.95

NAME: FASTPAK MAIL SYSTEM
TYPE: Mail System
COMPUTER: IBM PC, MS-DOS, CP/M 80
DESCRIPTION: Includes sorting, selecting, and letter merging capabilities. Easy to use menu operation, no fuss, no set-up last name and first name, four line addresses, phone number, and reference codes, high speed data entry and correction. Runs standard mailing labels or four wide cheshire labels, master listings, or phone number listings. Files can be sorted by last name or company name, or by zip code, or by reference code. The merge program allows combining mailing list data with text files. Any part of mailing list can be inserted at any point in the letter.
PUBLISHER: DHA Systems & Software, 832 Jury Court, San Jose, CA 95112; (408) 947-1011
COST: $79.95

NAME: SOURCE PRINT
TYPE: Structured Formatting Utility
COMPUTER: IBM PC, PC/XT, PC AT, portable, or any compatible
DESCRIPTION: This new software is extremely useful for organizing data and for clarifying structures on printouts. Source Print will format printouts of source code in C, Pascal, BASIC, and dBASE II and III. A unique "structure outlining" feature shows programmers their overall structure at a glance. To indicate the structure, Source Print automatically draws lines on the printout, something users ordinarily do by hand. The nesting of program structures is clearly shown. This reduces error. "Source library maintenance" is another feature of this software utility. Up to 40 selected subtitled functions or procedures--or ranges of these--can be taken from 1 to 16 files, to form a new source file. This feature is also useful for extracting information from other types of documents and reports.
PUBLISHER: Aldebaran Labs Inc., 3738 Mt. Diablo Blvd., Bldg. 312, Lafayette, CA 94549; (415) 283-7084
COST: $97.00

NAME: TURBO EDITOR TOOLBOX
TYPE: Software Editor Program
COMPUTER: IBM and true compatibiles
DESCRIPTION: Turbo Editor Toolbox users can incorporate its sample editors into their applications--customizing them any way they would like--or build their own editor or word processor with special features, commands, and menus to meet their specific application needs. If a user has Turbo Pascal, he or she can compile either of Turbo Editor's two sample editors and use them immediately. One of the sample editors is called the Simple Editor and it includes all the default editor commands and full windowing capabilities. The package also contains an adaptation of the best-selling WordStar word processor, called MicroStar. The Editor Toolbox has 16 software modules and a layered design that allows access to streams of text at the character, word, line or window level.
PUBLISHER: Borland International, 4585 Scotts Valley Drive, Scotts Valley, CA 95066; (408) 438-8400
COST: $69.95

NAME: EZTAX PLAN
TYPE: Tax Planning Program
COMPUTER: Apple IIe and IIc, Macintosh, TRS-80 Model 4 and 4P, MSDOS/PCDOS including IBM PC, XT, AT, Jr, and compatibles. It requires Multiplan, Lotus 1-2-3, or Excel software, 128K and one disk dirve.
DESCRIPTION: EZTax-PLAN facilitates individual tax planning and projection for users of Multiplan, Lotus 1-2-3, and Excel, and is designed to allow individuals to develop the best tax strategy in the last amount of time; make timely, confident tax planning decisions; and pay the lowest tax legally allowed. It computes present and future individual returns, parallels Form 1040 and related schedules, and allows all income adjustments, deductions, and credits to be entered and projected.
PUBLISHER: EZWare Corporation, 29 Bala Avenue, Bala Cynwyd, PA 19004; (215) 667-4064
COST: $95.00

NAME: THE SEBASTIANI GUIDE TO FINE FOOD AND WINE and ALMADEN'S FINE FOOD AND WINE ENTERTAINMENT GUIDE
TYPE: Cooking Programs
COMPUTER: Apple Macintosh (II and IIe) and IBM/compatibles
DESCRIPTION: Both automated cookbooks offer four-course-meal menu options ranging from low calorie selections and seasonal menu specials to a choice between informal and black tie food presentations. Once a menu has been selected, the cook can then call up the wine selection tips and choose between three and six recommendations for the right wine to complement each dish. Complete descriptions of each wind and hints on cooking with wine can be consulted at any point to aid in the wine selection and the cooking process. The Almaden cookbook features 125 traditional recipes from Almaden's 130-year California history and the original recipes of the company's resident chef, Jon Kasky. Cooking hints and a glossary of cooking terms are included.
PUBLISHER: Cimmaron Data Systems, 8402 S.E. Wilshire Drive, Scottsdale, AZ 85257; (800) 221-9280
COST: $29.95 each

NAME: REALTYPE (a new and more powerful version)
TYPE: Typewriter program
COMPUTER: Most CP/M computers (including Apple II and II + systems equipped with CP/M cards), IBM PCs and compatibles, and MS-DOS systems
DESCRIPTION: Still easy to use as a typewriter. Added features: "un-delete" and option of saving text to a file. Users can type and edit, save their typing to a file, assign keys to send commands to their printers for features like boldface printing, subscripts, and superscripts, and with "un-delete," restore up to an entire line of erased typing, "cut and paste" text within a line, and change the keys assigned to any command. Source code (written in Turbo Pascal) is also included on the RealType disk; users familiar with programming can make further modifications.
PUBLISHER: Real-Life Systems, 3766 Loma Vista, Oakland, CA 94619, (415)386-2867
COST: $14.95, plus $1.00 for shipping and handling

NAME: HYPERACCESS
TYPE: Communications Software
COMPUTER: PC-Compatibles
DESCRIPTION: A software program that allows communications through modems or cable with almost any other computer. Startup program configures everything for the user and on-screen tutorial demonstrates program's features in simulated use of MCI Mail, CompuServe, and others. HyperACCESS transfers files at rates above 1K per second, and error free. It allows the computer to be run from any remote computer or terminal, and it allows use of other programs, of DOS commands, or of DOS macros, from within HyperACCESS while on line. HyperACCESS includes the most powerful script language that not only lets users automate any sequence of keystrokes or steps, but it also lets them create custom functions, prompts, and menus, or accomplish unattended communications.
PUBLISHER: Hilgraeve Inc., P.O. Box 941, Monroe, MI 48161, (313) 243-0576
COST: $149.00

American XT



American XT Personal Computer

American XT Computer System Unit

Highlights Include:

- 256KB user or random access memory (RAM) standard...expandable up to 1MB on the system board (640KB DOS accessable).
- 8KB permanent or read only memory (ROM), which contains the BIOS and 56KB user usable.
- High-performance, high-speed, 16-bit 8088 microprocessor.
- Eight expansion slots that allow easy system expansion by using optional plug-in adapters.
- Two 360KB slim line diskette drives to support single-sided or double-sided, double-density, 5¼ inch diskettes.
- Optional 10MB or 20MB fixed disk drive.
- 135W power supply 110V/220V switchable.
- Four layer mother board to increase system reliability.
- Speaker for audio and music applications.
- Power-on automatic self-testing of system components.

Keyboard

American XT computer comes with a slim, lightweight keyboard. It features:

- An 84-key, typewriter-like format to help make it easy to learn and operate the system.
- A six-foot coiled cable that allows convenient movement of the keyboard.
- Power, caps-lock and num-lock LED indicators.
- A 10-digit, calculator-like numeric keypad for entering numbers quickly and easily.
- 10 special function keys to save time in activating commonly repeated tasks.
- A special "print screen" key that enables you to print out anything that appears on your display screen at any time.
- Typing angle can be adjusted to suit your working position.
- Optional enhanced keyboard with separated cursor and numeric keypad.

Hardware Specifications:

Size: width—20", depth—16", height—5.5".
Weight: without diskette drive—21 lbs; with two drives—28 lbs; with hard disk—33 lbs.
User Memory: cycle time—410 nanoseconds; access time—250 nanoseconds.
Environment: air temperature—60°F to 90°F system ON, 50°F to 110°F system OFF; humidity—8% to 80% system ON, 8% to 80% system OFF; noise levels-59dB (without printer); electrical—120V/220V AC, 60/50 cycles, 200 watts.

Software.

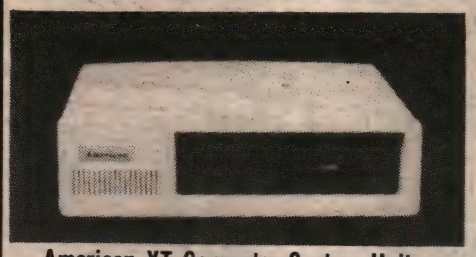
Runs all the popular programs written for the IBM PC/XT using the MS-DOS version 2 operating system.

System Specifications:

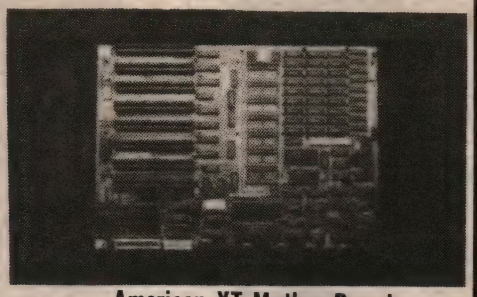
- **Model 1, Basic System.**
  - ☐ **256K bytes random-access memory (RAM).**
- **Model 2, Office System.**
  - ☐ 256K bytes random-access memory (RAM).
  - ☐ Two diskette drives with controller.
  - ☐ Color graphics card or monochrome card.
- **Model 3, Business System.**
  - ☐ 640K bytes random-access memory (RAM).
  - ☐ Two diskette drives with controller.
  - ☐ I/O plus with serial, parallel, game port and battery backup real time clock.
  - ☐ Color graphics card or monochrome card.
- **Model 4, Professional System.**
  - ☐ All the features of model 3 plus a 10MB fixed disk drive.
- **Model 5, Executive System.**
  - ☐ All the features of model 3 plus a 20MB fixed disk drive.

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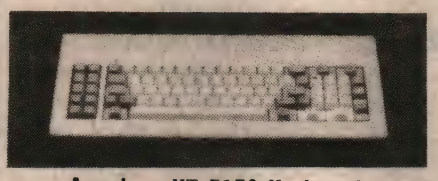
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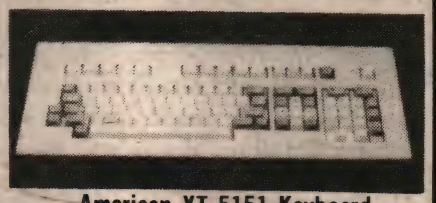
American XT Computer System Unit



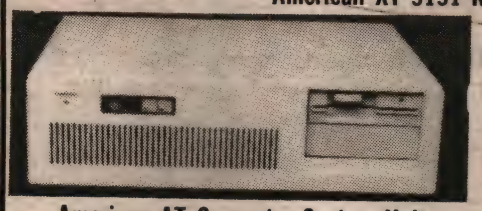
American XT Mother Board



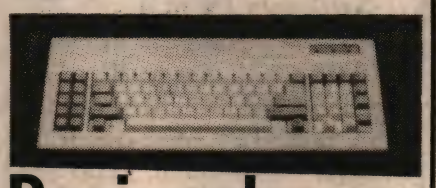
American XT 5150 Keyboard



American XT 5151 Keyboard



American AT Computer System Unit



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American AT



American AT Personal Computer

American AT Computer System Unit

Highlights Include:

- 512KB user or random access memory (RAM) standard...expandable up to 4MB by adding memory feature cards.
- 64KB permanent or read only memory (ROM), which contains the BIOS.
- High-performance, high-speed, true 16 bit 80286 microprocessor.
- Eight expansion slots that allow easy system expansion by using optional plug-in adapters.
- 1.2M high capacity disk drive to support 5¼ inch diskette.
- 200 watts power supply 110/220V switchable.
- Battery backup for CMOS configuration table and real-time clock.
- 7-channel direct memory access (DMA).
- 16-level interrupt.
- Three programmable timers.
- Speaker for audio and music applications.
- Power-on automatic self-testing of system components.

Keyboard

American AT computer comes with a slim, lightweight keyboard. If features:

- An 84-key, typewriter-like format to help make it easy to learn and operate the system.
- A six-foot coiled cable that allows convenient movement of the keyboard.
- Cap-lock, num-lock and scroll-lock LED indicators.
- A 10-digit, calculator-like numeric keypad for entering numbers quickly and easily.
- 10 special function keys to save time in activating commonly repeated tasks.
- A special "print screen" key that enables you to print out anything that appears on your display screen at any time.
- Typing angle can be adjusted to suit your working position.

Hardware Specifications:

Size: width—21.3", depth—17.3", height—6.8"
Weight: without diskette drive—33 lbs.; with one drive—37 lbs.; with hard disk—42 lbs.
User Memory: cycle time—275 nanoseconds; access time—150 nanoseconds.
Environment: air temperature—60°F to 90°F system ON, 50°F to 110°F system OFF; humidity—8% to 80% system ON, 8% to 80% system OFF; noise levels-59dB (without printer); electrical—120V/220V AC, 60/50 cycles, 300 watts.

Software.

Runs all the popular programs written for the IBM PC/XT using the MS-DOS version 3 operating system.

System Specifications:

- **Model 1, Basic System.**
  - ☐ 512K bytes random-access memory (RAM).
- **Model 2, Office System.**
  - ☐ 512K bytes random-access memory (RAM).
  - ☐ One diskette drive with controller.
  - ☐ Color graphics card or monochrome card.
- **Model 3, Business System**
  - ☐ 512K bytes random-access memory (RAM).
  - ☐ One diskette drive with controller.
  - ☐ Serial/Parallel interface card.
  - ☐ Color graphics card or monochrome card.
- **Model 4, Professional System.**
  - ☐ All the features of Model 3 plus a 20MB fixed disk drive.
- **Model 5, Executive System.**
  - ☐ All the features of Model 3 plus a 40MB fixed disk drive.

American ADD-ON

American Color Graphics Card

- Use state-of-the art technology GATE ARRAY LOGIC to increase reliability and reduce cost.
- RGB and composite outputs with 640 x 200 pels compatible to IBM standard.
- Light pen and RF modulator interface standard.

American Monochrome Card

- Use state-of-the-art technology GATE ARRAY CHIP to increase reliability and reduce cost.
- TTL output 720 x 350 pels with 25 lines x 80 column compatible to IBM standard.
- Built-in parallel printer port.

Floppy Controller Card

- Can control up to 4 drives.

Monochrome Graphics Card

- TTL Output 720 x 350 pels with 25 lines x 80 column for text mode.
- 720 x 348 pels in Graphics mode compatible to Hercules card.
- Built in parallel printer port.

I/O Plus Card

- Serial, parallel, game ports and real time clock.
- 2nd serial port optional.

Multifunction Card

- 384K RAM Sockets.
- serial, parallel, game ports and real time clock.
- With RAM Disk and PSPOOL software.

Hard Disk Controller Card

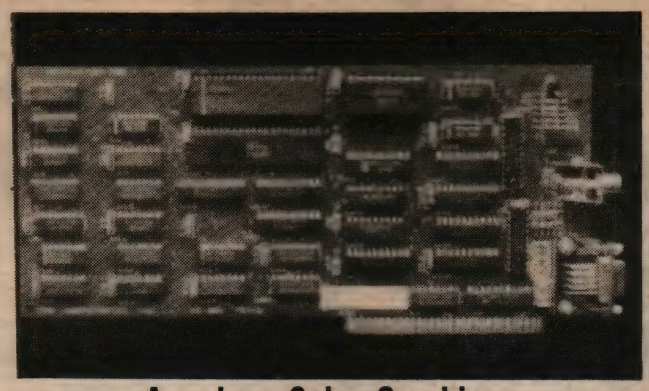
- Control up to 2-20M hard disk

Serial/Parallel for AT

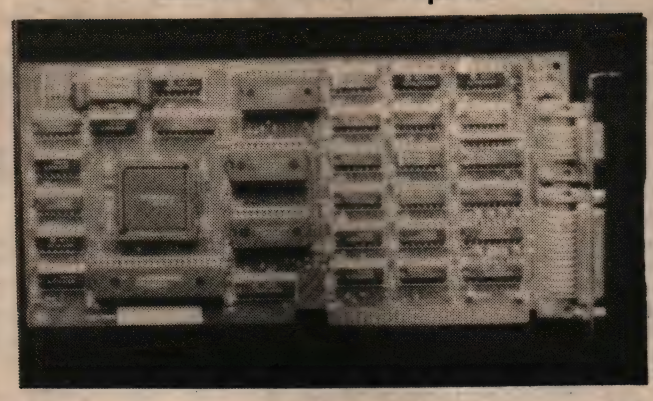
- Serial and Parallel Interface card for AT.

Controller Card for AT

- Control 2-1.2M floppy disk drives.
- Control 2-20/40M hard disk drives.



American Color Graphics



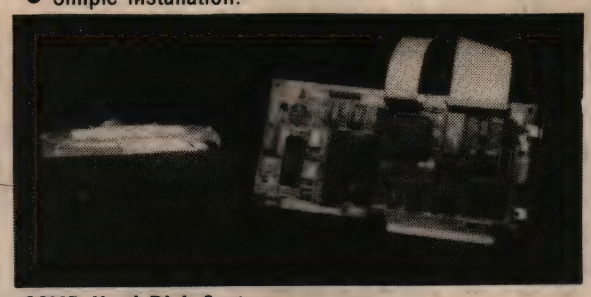
American Monochrome

American HD

American Hard Disk System

10MB Hard Disk System:

- Formatted and tested.
- Slim line hard disk with controller card.
- Simple installation.



20MB Hard Disk System:

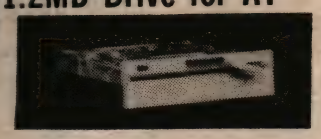
- Formatted and tested.
- Full size panel with controller card.
- Simple installation.

20MB Hard Disk for AT





1.2MB Drive for AT

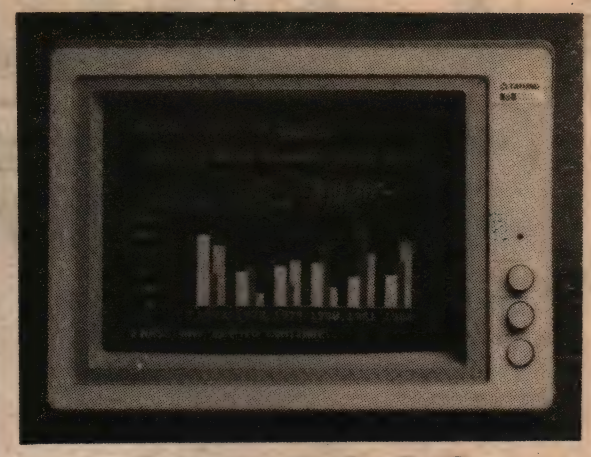


360KB Drive for AT



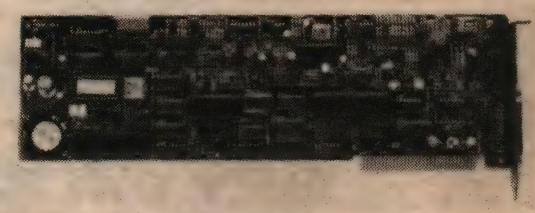
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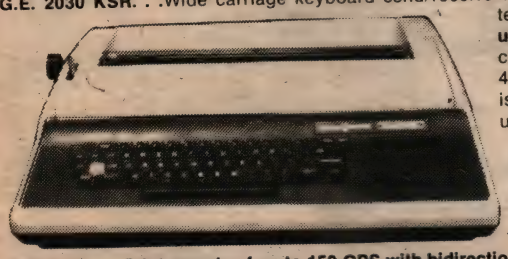
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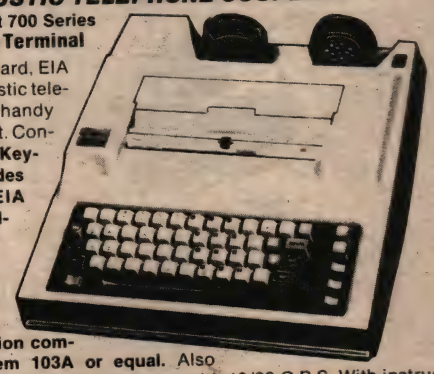
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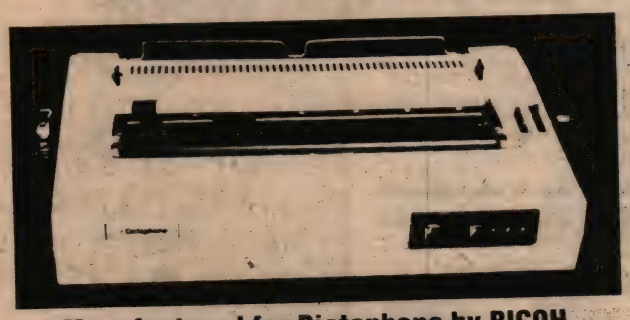
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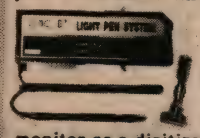
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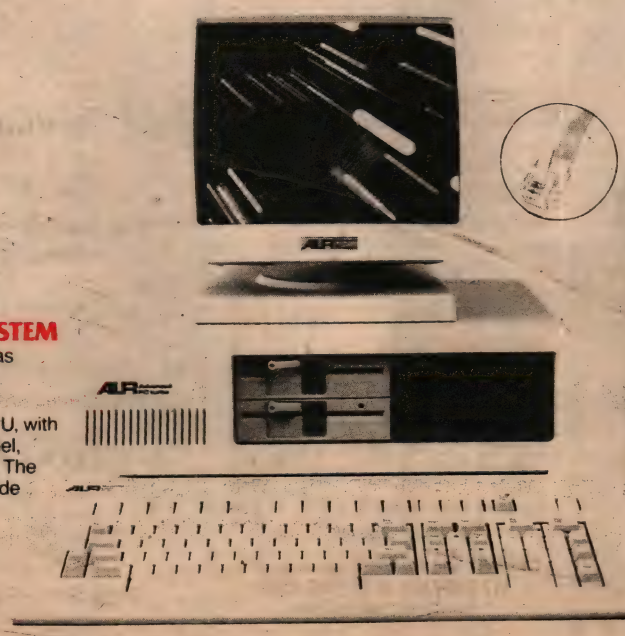
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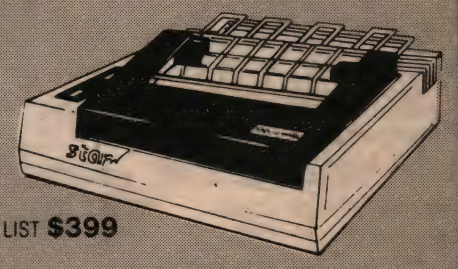
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CLASSIFICATION NUMBER AND CATEGORY

COMPUTERS
(133) Burroughs Systems 237
(136) Data General Systems 237
(138) Data General, Software, Peripheral 237
(148) DEC Systems For Sale 237
(149) DEC Systems Wanted 237
(150) DEC Software, Peripheral 237
(154) IBM Systems For Sale 237
(155) IBM Systems Wanted 237
(156) IBM, Software, Peripheral 237
(166) Misc. (Hardware & Software) ... 237

MICRO COMPUTERS
(105) Altos Computers For Sale 223
(105A) Altos Computers Wanted 223
(105B) Altos Software, Peripheral 223
(106) Apple Computers For Sale 223
(107) Apple Computers Wanted 224
(108) Apple Software, Peripheral 224
(109) Atari Computers For Sale 228
(110) Atari Software, Peripheral 228
(113) Commodore Computers For Sale 228
(113A) Commodore Computers Wanted 229
(113B) Commodore Software, Peripheral 229
(114) Franklin Computers For Sale ... 230
(115) IBM Personal Computers For Sale 230
(115A) IBM Personal Computers Wanted 230
(115B) IBM Software, Peripheral 231
(132) Heath Computers For Sale 237
(132A) Heath Software, Peripherals .. 237
(134) Hewlett Packard Computers For Sale 237
(134A) Hewlett Packard Computers Wanted 237
(134B) Hewlett Packard Software, Periph. 237
(111) Homebrew Systems For Sale ... 228
(116) NEC Computers For Sale 235
(116A) NEC Computers Wanted 235
(116B) NEC Software, Peripheral 235
(112) Northstar Computers 228
(112B) Northstar Software, Peripheral 228
(117) Ohio Scientific Computers 235
(117A) Ohio Scientific Computers Wanted 235
(117B) Ohio Scientific Software Peripheral 235
(118) Osborne Computers For Sale .. 235
(118A) Osborne Computers Wanted .. 235
(118B) Osborne Software, Peripheral . 235
(120) MS/DOS Computers For Sale ... 235
(120A) MS/DOS Computers Wanted ... 235
(120B) MS/DOS Peripherals 235
(121) Kaypro Computers For Sale 235
(121A) Kaypro Computers Wanted ... 235
(121B) Kaypro Software, Peripherals . 235
(123) Sanyo Computers For Sale 236
(123A) Sanyo Computers Wanted 236
(123B) Sanyo Software, Peripherals .. 236
(125) Sinclair Computers For Sale ... 236
(125A) Sinclair Computers Wanted ... 236
(125B) Sinclair Software, Peripheral .. 236
(101) Tandy Computers For Sale ... 221
(102) Tandy Computers Wanted 221
(103) Tandy Software, Peripheral 222
(104) Texas Instr. Computers For Sale 222
(104A) Texas Instr. Computers Wanted 222
(104B) Texas Instr. Software, Peripheral 222
(127) Xerox Computers For Sale 236
(127A) Xerox Computers Wanted 236
(127B) Xerox Software, Peripheral ... 236
(126) Misc. Microcomputers 236
(128) Misc. Micro, Software, Periph .. 236
(129) S-100 Computers 236
(130) S-100 Compatible Peripheral ... 237
(131) S-50 Compatible Peripheral 237

PERIPHERAL & MISC. EQUIPMENT
(172) Disk Drives 238
(174) Printers 238
(178) Tape Drives 238
(180) CRTS, Monitors 239
(181) CRT Terminals 239
(182) Terminals 239
(183) Multibus Boards 239
(184) Memory 239
(186) Modems 239
(187) Word Processing 239
(188) Misc. Equipment 239
(189) Books, Magazines 239
(190) Misc. Large Systems 239
(191) CP/M Software 239
(192) Misc. Software 240
(194) Misc. Accessories & Supplies .. 240
(195) IC's and Components 240

MISCELLANEOUS
(196) Help Wanted 240
(198) Positions Wanted 240
(199) Other 240
(200) Non-Computer 240

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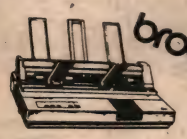


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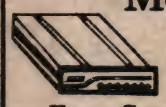
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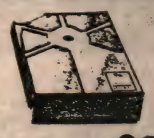
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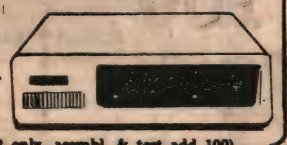


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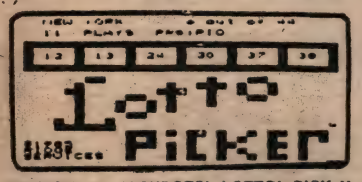
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Altos 986- complete multiuser system, Xenix, 40 megabyte disk, 3 televideo 910, Anadex and Okidata printer with complete Altos (open systems) Accountant business software package including word processing and many mods. Make offer. **505-881-0004.** 2-78.

BUY/SELL USED COMPUTERS
Quick/Easy/Best value•Thousands of items•For sale by owners•National Listing Service•No Commission•Only $22.95 to list until sold!

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800-832-8726 • VISA/MC Accepted • 617-491-4888. 2-74

70% OFF

Altos 586-40
$3495

512K, 40 meg. hard disk, used, 30 day guarantee. **Call BCE 202-944-3900.** See ad index for other BCE bargains!

New 186-10 $4753; 486-20 $5150; 586-40 $7700; 986T-40 $10705; 2086-2 $15865. All prices are cash. FC, CCR. Other units available. **Call 813-442-9967.** 3-75

(105A) ALTOS COMPUTERS WANTED

Altos 8000-14 40 meg. **302-656-8000.**

★★★

HARD DISK System wanted, Altos 8-kit, Z-80, series 8000 or 5-X. **N.A. Shyne,** 124 W. Curtiss, Bozeman. MT 59715. **406-586-2535.3-75.**

Wanted: Altos 586's, 986's, Altos tape drives, etc. Working or not. **Gene, 918-687-3161.** 2-74

(105B) ALTOS SOFTWARE, PERIPHERAL

80% OFF

Terminal Liquidation
Televideo 925's
$179

Reconditioned, 30 day guarantee. Call **BCE, 202-944-3900.** See ad index for other BCE bargains!



TDK DSDD DISKS
59¢

High Quality TDK Diskettes with hub rings and sleeves. 200 disks for $130 (.65 ea), 400 disks for $252 (.63 ea) or 1000 disks for $590 (.59 ea). Add $8.00 per order shipping. **Call BCE, 1-800-545-7447, 24 hrs.** See ad index for other BCE bargains.

(106) APPLE COMPUTERS FOR SALE

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128k APPLE IIe SYSTEM. Includes 128k, 80 column **APPLE IIe, DUODISK** Dual Diskdrive, **IMAGEWRITER** printer, **APPLE** monitor,

BODEX CORP.

224 East Main St. Marlboro Mass. 01752 Phone: 1-617-485-5115

HOURS: M-F 10-9
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SHIPPING FREE
UPS ONLY

ALL EQUIPMENT 100% FROM TANDY CORP.

TRS-80 COMPUTERS

• PURE RADIO SHACK EQUIPMENT •

TANDY 3000



1 DISK 1.2 MEG 512K — $1929.00

20 MEG HD 512K — $2649.00

We have all accessories

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$729.00

VM-2 MONOCHROME MONITOR $130.00

Memory Plus Board $249

256K Board $198.00
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MODEL 100
24K $429.00

MODEL 200
24K $629.00

OKIDATA PRINTERS

192P $379.00
193P $570.00

GEMINI PRINTERS

SG10 ..... $239.00
SG15 ..... $379.00

ALL TANDY PRINTERS ALSO

TANDY 2000

2 Disk Drive *$1295.00*
Hard Disk *$1990.00*

TANDY 1200HD



$1695.00

Monochrome Monitor—$186
Monitor Card—$219
MS-DOS—$79

ALL PRICES CASH
ALL PRICES ARE SUBJECT TO CHANGE
TRS 80 is a trademark of Tandy Corporation

system saver, interfaces, & 40 FILLED DISKS. Asking $1380. Almost new. Write: **M. Dahms,** 472 Madison, Toms River, NJ 08753.

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APPLE STUFF!!

IIe's, IIc's, II+'s. Also motherboards, keyboards, power supplies, etc. We buy, sell and horsetrade most popular machines. **Shreve Systems,** 845 Lark Ave., Shreveport, LA 71105. **318-865-6743** 4-9 pm CST. 3-79

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All used products over $100. Buy/sell through nationwide listing service. **NO CHARGE** for buying direct from owner. **NO RISK** for sellers - 6% commission when successful. Open 24 hours if you have a touchtone phone. **203-762-8677.**

COMP-USED

86 Rivergate Drive, Wilton, CT 06897. 3-76

Apple IIe Computer, monitor, disk drive, Control Card, Word Processor, Database, and over 200 otherr programs. Call **803-279-7500.**

Apple II+, monitor, disk drive, printer, with 200+ programs, $690. Call **Walt, 803-279-7500** N. Augusta, SC, Excellent condition S&H - COD). 3-76

Apple II+, monitor, disk drive, printer, and over 200+ programs $650. Call **Walt VanDine, 803-279-7500** N. Augusta, SC. 3-75

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B.B.I. WHOLESALE NETWORK- A membership B.B.I. for USED and NEW "Special Buy" computers. See display ad in **COMPUTER SHOPPER** Mart or call **916-344-1956.** 2-75

BUY/SELL USED COMPUTERS

Quick/Easy/Best value ● Thousands of items ● For sale by owners ● National Listing Service ● No Commission ● Only $29.95 to list until sold!

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For Sale: Apple IIe Compatible computer 128K with disk drive and 80 col. card $650. **Jim Moore. 504-386-2329** or 800-821-5226 Ext. 124. 1-77

68% OFF

1200 BPS Modem Liquidation $189

USRobotics Password 1200/300 bps Modem. Autodial/Answer. Works with PC-Talk, Crosstalk and most othe communications software. Works with IBM, Apple, Kaypro, etc. RS232-C male/female interface. Compact design. Add $5 per modem shipping. **BCE 1-800-545-7447** 24 hours. See ad index for other BCE bargains.

80% OFF

40 CPS Letter Quality Printer Liquidation $349

Wide carriage, 40 CPS daisy-wheel letter quality printer. Made by **C. Itoh.** For complete list of features and specifications, **see ad index** for full page display ad and other BCE bargains. **BCE 1-800-545-7447 24 hrs.**

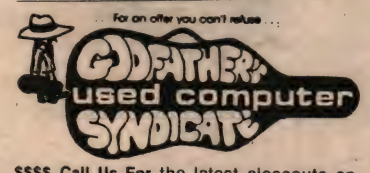
ATTENTION Apple, Atari and Mac owners Save 30% or more on software. This ad is much too small to tell you about our super software price. Call or write for a FREE catalog (specify your computer type). **Delson's Catalog Offer, 19801 Vanowen St., Canoga Park, CA 91306, 818-887-5260**



60% OFF

Attention Wordstar Users! Up to 60% off: for Apple II, II+, IIe

Spellstar- corrects spelling from 20,000 word dictionary. **Starindex**- creates alphabetized indices and tables of contents. **Mailmerge**- merges files for personalized form letters; assembles mailing labels. Any single package - list price is $99, our price is $75 (25% off). Combination of any two different packages- list price is $198, our price is $99 (50% off). All three packages- list price is $297, our price is $119 (60% off). **Call BCE,** 7 days a week, 24 hours a day. **1-800-545-7447.** See ad index for other BCE bargains!



$$$$ Call Us For the latest closeouts on Compatibles and Used Apples. **Godfather's Used Computer Syndicate,** PO Box 3037, 1154 W. SR 436, Forest City, FL 32714. **305-774-1111.** 3-76

70% OFF

NEC NLQ Printer Liquidation $149 Lowest Price Anywhere!

NEC PR103A 110 CPS parallel Dot Matrix Printer. High speed NLQ mode. Compatible with NEC 8023A (same as Apple Graphics Printer and C. Itoh Proprinter). Centronics interface, full warranty. Add $15 per printer shipping. See ad index for full page display ad with complete specifications. **BCE 1-800-545-7447 24 hours.**



80% OFF

Wordstar Professional 80% off Wordstar Spellstar Mailmerge Starindex + Appli-Card CP/M Board For Apple II, II+, IIe $169

The package includes **Wordstar** version 3.3, Spellstar, Mailmerge, and Starindex. Also included is an **Appli-Card CP/M board** with CP/M version 2.2. The card runs at 6MHz (roughly 5 times faster than the Apple processor), has 64K RAM on board and can be used as extra memory, or as a RAM disk under Apple DOS. It also allows use of 70 columns without an 80 column card (or 80 columns with an 80 column card that you've already installed) and upper and lower case (the shift modification is included). The card allows file transfer between Apple DOS and CP/M. It works with Apple II, II+, and IIe, and comes with the manufacturer's one year warranty. unopened, shrink-wrapped boxes. **Wordstar Professional and Appli-card-** list price is $870, our price is $169 (80% off) Save over $700! **Wordstar Professional-** list price is $395, our price is $139 (65% off). **Appli-Card CP/M board-** list price is $475, our price is $119 (75% off). Quantities are limited; to order call **BCE** toll free, 24 hours a day, 7 days a week. **1-800-545-7447.** Se ad index for other BCE bargains!

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RAM CARD for Apple IIe! 512K = $149. Call **Rick Stealey 201-876-4586.** Compuserve ID = 70317, 2364. 3-75

(107) APPLE COMPUTERS WANTED

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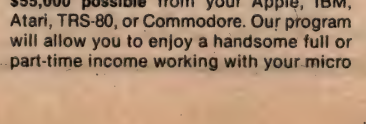
All used products over $100. Buy/sell through nationwide listing service. **NO CHARGE** for buying direct from owner. **NO RISK** for sellers - 6% commission when successful. Open 24 hours if you have a touchtone phone. **203-762-8677.**

COMP-USED

85 Rivergate Drive, Wilton, CT 06897. 3-76

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B.B.I. WHOLESALE NETWORK- A membership B.B.I. for USED and NEW "Special Buy" computers. See display ad in **COMPUTER SHOPPER** Mart or call **916-344-1956.** 2-75



$$$$ I Buy, Sell, Trade Apples. **Godfather's Used Computer Syndicate,** PO Box 3037, 1154 W. SR 436, Forest City, FL 32714, 305-774-1111. 3-76

Paying $5.00 per pound for scrap tantalum capacitors. Any amount, fast payment! Ship: **Sciuto,** 103 Saratoga St., Lawrence, Mass. 01842. 9-79

WANTED: Macintosh software originals with manuals. Randy Bugg, 94 Geraldine, Smyrna, GA 30080.

(108) APPLE SOFTWARE, PERIPHERAL

$$$WIN with Thoroughbred, Harness, Greyhound Handicapping Software ... $29.95, enhanced ... $49.95. Free information. **Software Exchange,** Box 5382, W. Bloomfield, MI 48033. **313-626-7208. 2-75.**

$25 APPLE BUILDER KEYBOARDS

FULL ASCII, unused, upper/lower case, all control characters, **CAPS-LOCK** and **REPEAT** keys, **NUMERIC PAD,** simple modifications for right and left arrows, parallel output, positive logic, strobe, self-test, 5 volts. Custom case available. Over 400 happy customers. New, closeout pricing to make room in warehouse. Keyboard $25. Documentation/cable/mod package $5. Spare CPU/ROM $4. All 3 ($34 value) $30. UPS additional, 5 lbs. Call/stamp for full spec-sheet. **Electrovalue Industrial,** Box 376-CK, Morris Plains, NJ 07950. 201-267-1117, M-F, 10-5. 01-83

25¢ PROGRAMS for your "Apple". Hundreds to choose from. Educational, business, scientific, games and more. Catalog: $3.00 (refundable with first order). Public Domain Library, Box CS, **Duncan Institute,** 18 Duncan Drive, New Port Richey, FL 33552. 3-79

40 TRACK DRIVES:

MOST 5¼" drives can handle 40 tracks. Information and software available for DOS 3.3 and PCPI CP/M. $17. **FUGI,** 83 East Wind, Tecumseh, MO 65760. Modem 417-869-5294. 3-76

$55,000 possible from your Apple, IBM, Atari, TRS-80, or Commodore. Our program will allow you to enjoy a handsome full or part-time income working with your micro computer. You set your own hours and can work directly out of your own home or office. Twenty-five percent of the 500,000 millionaires in the United States made their fortunes using this method! It has been used by, and is responsible for the rapid growth of some of America's largest corporations. This is not a pie in the sky dream, it's just a good business program that works! We provide all of the materials and know-how needed to make big money. Don't confuse this offer with ripoffs you may have sent away for. This is a totally new marketing concept for computer owners. All you need is your computer with a disk or tape drive, word-processing software, and a reliable printer. For complete details send $10 check or money-order to: **Applied Micro Research Co.,** 4159 Bradford, Saginaw, MI 48603.

5 MEGABYTE add-on hard disk subsystem for Apple or Franklin. Kit $350. For technically oriented persons. **Digital Search,** 803-877-9444.

ACCOUNTING SOFTWARE

This is a fully integrated five module accounting package with General ledger, Accounts Receivable, Accounts Payable, Payroll, and Inventory. The system requires an Apple II compatible computer, printer, dual floppy drives, or hard disk. The system is menu driven and comes with a manual. Training and custom modification are available. **Custom Software Support Systems,** 233 Maplewood Ave., Youngstown, OH 44471. **Phone 216-755-1650.** 3-76

APPLE BUILDERS

Applesoft ROMS - new higher price. Apples wholesale price is now $45 per ROM. Our price is $85 per set of 6 or separately, $20 each. Genuine Apple parts. Upper/lower case video character generators, $20. Specify USA (revision 7 or later) or Asian clone version. UPS $2 per order. IC sets, manuals, keyboards. Request full flyer. **Electrovalue,** Box 376-CS, Morris Plains, NJ 07950. 201-267-1117. 11-81

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APPLE CP/M PUBLIC DOMAIN. Modem7 terminal program assembled for your Apple. Lets you download CP/M programs $7 postpaid. Specify equipment. Free list of CP/M Public Domain. Diskette conversion to and from Apple, IBM, and CP/M send for list. **Softhaus,** Box 4150-CO, Vero Beach, FL 32964-4150. **305-231-0912.** 1-74

APPLE FORTH: Powerful programming language with machine language speed. Forth system; $30 (with source code: $50). Enhancements: $10. Hi-Res routines: $20 (with source code: $30). All: $75. Shipping free! **316-683-4719. Alexi Haines,** 215 N. Terrace, Wichita, KS 67208. Check/MO.

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Softcard II	$190
Koala Pad	$60
Prome Versacard	$95
Prome Hme contrl.	$20
Novat Auto-cat	$50
Tit 128 ramcard	$110
Z-Term (pro)	$40
Acecalc	$15
Penguin Graphics	$15
Profiler-databas	$25

Applewriter and VC preboots. Dvnacomp games. Beagle Bros disks and other misc software. Several Books. $10 each. **John Haddad 316-365-7264.**

APPLE HARDWARE/SOFTWARE SELLOUT! Items are as-new with all original documentation. Apple four pen Color Plotter Model 410, lots of supplies, used two hours (II+, IIe, IIc, Mac), original $1000 list, now $425! Stoneware DB Master version 4 Plus database (II+, IIe, IIc), unused, $295 list, $125. THE WORD Processor (King James Bible on disk) by Bible Research Systems (ii+, IIe), $200 list, $85. Applewriter word processor (II+) $30. Helix database, latest version 2.0 (Mac), totally complete, $395 list, $165. Dollars & Sense (Mac), $150 list, $60. Thinktank 128 (Mac), $145 list, $55. MacAdvantage MailManager, $119 list, $45. Numerous Mac clip art programs, inquire. Offers and trades considered. Prices include UPS/COD shipping. **Fred Fishman,** 2481 Willowspring Court, Cincinnati, OH 45231. **513-851-7413 evenings.**

APPLE IIe EXTENDED 80-COLUMN CARDS

100% FUNCTIONALLY EQUIVALENT to Apple's $250 "A2B2023" card. Plugs into the AUX card slot to give you 80-column ability, an additional 64K of memory (128K total), and (requires Rev. B mother board) double hi-res color graphics. **$50 each,** includes surface UPS, add $2 for 2nd day air. **Electrovalue Industrial,** Box 376-CE, Morris Plains, NJ 07950. 201-267-1117, M-F, 10-5. 1-83

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APPLE LETTERS

Now that you've mastered the use of your word processor, let this disk help you put your thoughts on paper. Contains 25 letters to cover all types of situations. Cover letters for your resumes, complaint letters for products and services, letters to order products and to cancel orders plus many more. These letters were written by an executive secretary at one of the nations leading banks. Give your correspondence that professional look, and all you do is fill in the details. Use with any word processor that uses standard DOS 3.3 Text Files. Satisfaction guaranteed or money back. Copyable disk only $19.95 pp. **Chesapeake Graphics Inc.,** 7070 MacBeth Way, Sykesville, MD 21784. 2-74

APPLE MANUALS

THESE ARE the original, hard to find manuals you need: Apple DOS 3.3 user manual (A2L2002) $16. Apple DOS 3.3 Programmer's Manual (A2L2012) $12. Applesoft BASIC Programming Reference Manual (A2L0006) $15. All 3 for $40. Add UPS, $2-1st, $1 each additional. Request 8 page flyer. **Electrovalue,** Box 376-CM, Morris Plains, NJ 07950. 201-267-1117, M-F, 10-5. 1-83

APPLE PASCAL users. Pop-up *Monitor, versatile *Edit, *Util and other programs. **dogStar Software,** Box 302, Bloomington, IN 47402. 3-83

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APPLE SOFTWARE!

The very best original public domain software for Apple type computers, large selection over 10,000 programs on more than 200 diskettes. 7 catagories to choose from: Utility, personal, business, Educational, Recreational, professional, Miscellaneous. Most programs have been updated, formatted and run with DOS 3.3 Single diskettes $3.95 each. 7-Diskettes set $19.95, including **"FREE"** a catalog file system, with catalog files and auto run feature. 20-Diskette set with hard cover binder with the above free gift and 2-plastic library case $49. Try before you buy. Send $3.95 for demo diskette with all types of free software and catalog filer (miniversion). **COMPUTER SOFTWARE INTERNATIONAL,** Route #2, Box 478, utica, KY 42376.

A-Peeling Ads-Newsletter just for the Apple owner. Many programs, articles, reviews, a help column, club and BBS list. Send $.50 for sample copy to: **P.D. Software,** PO Box 13124, Houston, TX 77219. 1-77

Apple II Plus, 64K, 2 drives, monitor & printer, E.C. $600. Apple II Plus compatible, disk drive, monitor, printer, EC $400. Apple Super Serial Card, $50. Corvus 5.5 megabyte hard disk drive for Apple with 70 megabytes of off line storage, E.C. $400. Call **Mike 313-661-8695.** 3-75

Apple IIc, IIe, II+ owners! I want to trade with you! Please send your list and I'll send you mine. **RD,** 2112 N. 42nd, Seattle, WA 98103.

Apple Public Domain software $2.50 a disk or you furnish disk $1.00 each side plus $2.50 shipping. Blank disks available. Send $2.00 for catalog and get a free disk of software with your software or disk order. Mac Public Domain software $5.00 a disk plus $2.50 shipping. Blank disks available. Send $3.50 for catalog and get a free disk of software with your software or disk order. We also carry brand name software. A listing sent with above catalog or if requested sent separate. We also handle Apple compatible hardware. Send check (CCR) or m.o. (U.S. Funds only) to: **B & L CONSULTANTS & SALES,** Box 461, Wabash, IN 46992. 3-75

Apple Software- All the latest at very low prices. Plust blank disks and other Apple items. Free catalog. **P.D. Software,** PO Box 13124-A, Houston, TX 77219. 1-77

Apple loader Commodore/Apple interface for Apple II & II PLUS. Transports software between Apple and Commodore. New card and cable, easy instructions. Regular $89.95, send only $15PP. **ISE,** Dept. 25, Box 8256, Brownsville, TX 78521. **512-831-9341.** 2-74

BAR SWEEP disk converts the APPLE II series computers into a full function bar sweep pattern generator. Use to instantly determine the horizontal resolution (video response) of TV, monitor, VCR, video camera, etc. Functionally equivalent to bar sweep (multiburst) pattern produced by expensive video analyzers made by Sencore or B&K. Data Sheet included $18.95. **Solas Products,** Box 665, Springhouse, PA 19477. **"Because a clear picture matters!"** 3-76

CHICK PIX: Hi-Res images of sexy chicks stark naked. 17 images @ $1.50 each. $20 for all. $5 for utilities. $6 minimum. **316-683-4719 Alexi Haines,** 215 N. Terrace, Wichita, KS 67208. Check/MO

COMPUTEREYES by Digital Vision $105, with camera $310. Modem with software, $64.97. Summer Games II by Epyx $26.75. COMPUSERVE Starter kit $19.50. PRICES INCLUDE SHIPPING. To order send payment or call. VISA/Mastercard accepted. PA residents add 6% Sales Tax. **Seneca Software,** 1104 Seneca Drive, R.D. #2, Harmony, PA 16037. **412-452-8418.**

CP/M SIDEKICK

WRITE-HAND-MAN a Sidekick like utility for CP/M 3.3. (Softcard and PCPI). See CP/M software. 3-76

CRAKNIQUES: Learn how the experts crack the top programs on the market. Teaches you how to crack any program. It is not a "cookbook" like Craking Techniques and HardCore. Comes with sample disks to practice cracking. Send $20 to: **Matt Haines,** 215 N. Terrace, Wichita, KS 67208. **316-683-7419.**

CUSTOM APPLE PARTS

WE'VE OBTAINED a small supply of many of the custom ICs for the Apple II + and Apple IIe computers. These are real Apple parts, some new, some used, all tested and guaranteed. ROMs, keyboard encoders, P5A, P6A, video character generators, HAL/PAL, MMU etc. All priced below Apple wholesale. Enquiries from repair services who know what they want are welcome. We are NOT able to advise clone builders which parts are suitable for which clones. **Electrovalue Industrial,** Box 376-CP, Morris Plains, NJ 07950. 201-267-1117, M-F, 10-5. 1-83

DISK NOTCHER (Square 5¼" diskettes) $4.95; DISKETTE STORAGE BOXES (5¼", holds 120 w/lock) $13.95 OR both items $16.95; Send to: **Computer Hardware & Software,** 1815 26th Street, Cuyahoga Falls, OH 44223. 3-76

Executive Peripheral System KeyBoard for Apple, User function keys, number pad, four E-PROMS (dBase II, Basic/CPM, WordStar, VisiCalc). Never used, original value $360...will sell for $200. **Call Chris 203-464-6450.**



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FREE PROGRAMS!! Apple-II/Apple-IIe/Apple-IIc/MacIntosh/Adam/all IBMpc's, Commodores, TRS-80's, Timexes/TI99-4A. Send Stamps! **EZRAEZRA,** Box 5222-PAFE, San Diego, CA 92105.

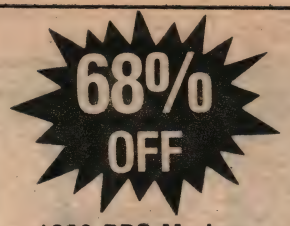
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GRAPHICS for your Apple II + , IIe, IIc. This program will collect them on disk from games, etc. Hi-res, both pages. Save or Load in 4 sec., invert, combine for montage. Appleworks type menu. Supports Grappler directly or use your own print dump software. IMAGE JUGGLER. Also available: WRITE STYLE for your IMAGEWRITER and APPLE DMP. Bold, condensed, enlarged, proportional, slashed zeros, and unidirectional at a keypress. In & out in less than 1 min. sets up printer for any printing job. Any Apple II. OUR POLICY: TRY BEFORE YOU BUY. Send only $5 per program. This pays for shipping & materials. Then, if you like our programs, make it legal by sending $20 for each program desired. Manuals and validation stickers will follow. Otherwise we trust you to erase disk. **Green Mountain Software,** Dept. S, PO Box 40853, Portland, OR 97240.

Games!!! for the Apple IIe, IIc and III systems. Public Domain Disk full of games for $19.95. Send check or money order to **Gennaro Conte,** 2522 Holland Avenue, Bronx, New York 10467. Compuserv ID: 74005,1064. 9-76

Home Security System for C64 V-20. Includes all hadware, software. "As cheap and easy to use as you can get." Personal Computing Magazine **215-398-0434.** 2-75

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Know When And Where To Look With Or Without A Telescope!
Provides sky locations of the comet, moon and major planets for any place and time in 1985-86. Apple, IBM, TRS-80 (I) versions open (in BASIC), with explanatory booklet, **$30** plus s/h and tax in CA VISA/MC
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360 Moore St., Santa Cruz, CA 95060
To Order Call Now
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1200 BPS Modem Liquidation $189

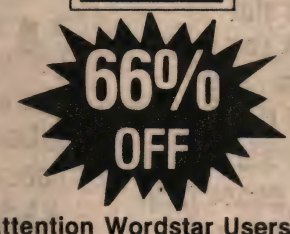
USRobotics Password 1200/300 bps Modem. Autodial/Answer. Works with PC-Talk, Crosstalk and most othe communications software. Works with IBM, Apple, Kaypro, etc. RS232-C male/female interface. Compact design. Add $5 per modem shipping. **BCE 1-800-545-7447** 24 hours. See ad index for other BCE bargains.



40 CPS Letter Quality Printer Liquidation $349

Wide carriage, 40 CPS daisy-wheel letter quality printer. Made by **C. Itoh.** For complete list of features and specifications, **see ad index** for full page display ad and other BCE bargains. **BCE 1-800-545-7447 24 hrs.**





Attention Wordstar Users! Up to 60% off: for Apple II, II + , IIe

Spellstar- corrects spelling from 20,000 word dictionary. **Starindex**- creates alphabetized indices and tables of contents. **Mailmerge**- merges files for personalized form letters; assembles mailing labels. Any single package - list price is $99, our price is $75 (25% off). Combination of any two different packages- list price is $198, our price is $99 (50% off). All three packages- list price is $297, our price is $119 (60% off). **Call BCE,** 7 days a week, 24 hours a day. **1-800-545-7447.** See ad index for other BCE bargains!



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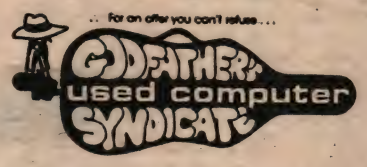
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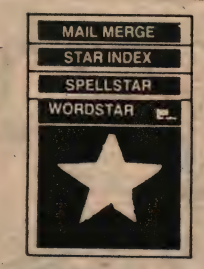


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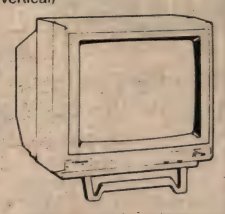
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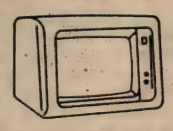
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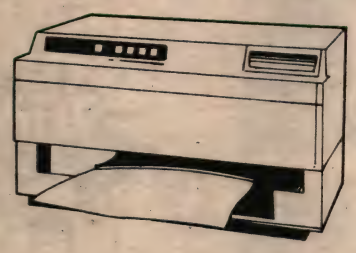
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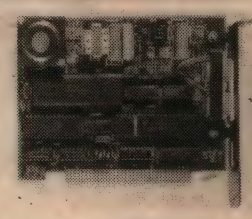


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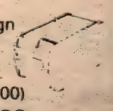
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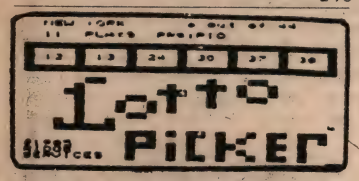
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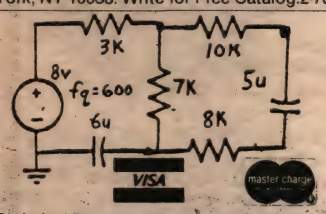
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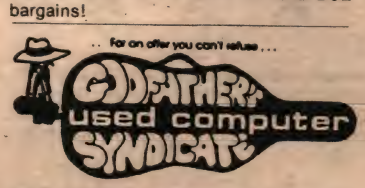
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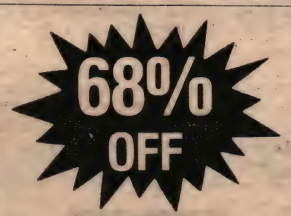
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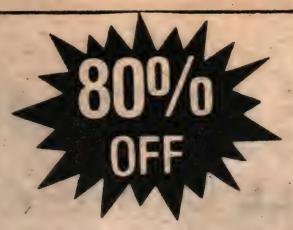
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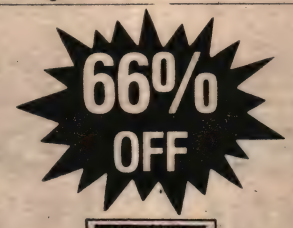
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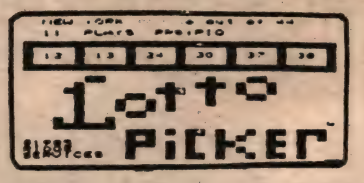
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TURBO PASCAL forms designer. Produces source code for screens you "draw". Complete I/O routines in minutes. Send $19.95 to **Bearbyte Computer Applications,** 2055 Bethabara Rd. #47, Winston-Salem, NC 27106. SASE for further details.

The Good Word

NEW! NEW! Get THE Good Word! Don't joke around. Start your day with a meaningful **Bible** message. The Good Word produces a different reading each day for one year. Each day's passage is revealed following system boot or whenever you enter the command GOODWORD. For PC, XT, Jr. and compatibles. Order Today. **FREE** Calculator software included. Send $24.95 to **Computer Customware & Consulting,** 3911 Fain Court, Montgomery, AL 36109. 2-75

Used software all original with documentation at $7 each. Championship Boxing, Ghost Busters, Tracer Sanction, MicroLeague Baseball, One on One, Solo Flight, F-15 Strike Eagle, Lode Runner, Pinball Construction Set. **Michael Krasowski,** 703 Wilson St., Chester, PA 19013. 3-75

WHY PAY DOUBLE? Buy PC/CLONE Public Domain -$3/DS-DD DiskFULL, including disk. **804-851-6864. Colony,** Box 808, Langley AFB, VA 23665.

(116) NEC COMPUTERS FOR SALE

NEC-APC, 384Kb., monochrome w/graphics, 2x8"drs, MS-DOS C/PM-86 CC/PM-86 P-system, w/cables, accessories, WordStar, SuperCalc 2, dBase II, various software $1500. Cables. **James Thompson,** 2540 Booker Creek Rd., Chapel Hill, NC 27514. 2-75

NEC APC w/color monitor, dual 8" disk drives, & letter quality printer. Includes MS-DOS, WordStar, MultiPlan, dBase II, $1100. **Call 203-743-4121 evenings.**

NEC-PC8001A plus PC-8012A wanted. Phone **(805)934-1191** or write to: **Ken Martin,** POB 2579, Santa Maria, CA 93455.

NEC PORTABLE

8210A Computer (similar to Radio Shack M-100) **Microsoft basic,** word processor, and modem software built-in. 16K RAM expandable to 96k. Uses 4 AA BATTERIES. Retains programs in CMOS RAM WHEN TURNED OFF. EXCELLENT FOR TRAVEL, VERY POPULAR WITH REAL ESTATE PEOPLE FOR LOAN CALCULATIONS AT THE SITE, VERY POWERFUL COMPUTER WITH MANY SOFTWARE PROGRAMS INCLUDED. THREE MANUALS INCLUDED. Built-in LCD display is 40 column, 8-line. Full size keyboard. Weighs less than 5 lbs. Parallel printer port, R232C serial port, modem ready, can use 32K RAM cartridge. As new, never used, boxed, $199 plus $7 shipping.

NEC8025 PRINTER 132 COLUMN

Boxed, never used. Commercial quality dot-matrix, standard centronics interface, works with IBM. $325 plus shipping.

Also have three 80-column NEC8023AN printers, otherwise identical to above, $199 plus shipping.

JIM REYNOLDS, 410 Lark A1, Carmel, IN 46032. **317-846-3373.**

(116A) NEC COMPUTERS WANTED

NEC-APC, NEC-3530 SpinWriter, NEC-P5, Epson LQ1500 wanted in running condition. **201-757-2839,** Box 187, Newark, NJ 07060. 3-77

(116B) NEC SOFTWARE, PERIPHERAL

NEC-APC's 2 @ 128k; 1 @ 512k; 10 MHD; Complete software; WS; DB11; SCALC2; Best Offer. **215-641-1329, Philadelphia.**

NEC PC-8201A-Send for free catalog of compact affordable software. **CSA Software,** PO Box 22261, Chattanooga, TN 37422.01-75.

NEC Spinwriter letter quality printer model #5510, 2 CRT screens with keyboards, a Lanier dictaphone with telephone remote, a new R:Base 5000 in shrink wrap. Sacrifice. Call **305-783-4300.**

PUBLIC DOMAIN PC-8000 software. 95 CP/M and NBasic disks, $4 each. Send SASE for catalog. **Long Island NEC Users Group,** 75 Weaving Lane, Wantagh, NY 11793. 2-78

(117) OHIO SCIENTIFIC

OSI- C30EM Dual 8" Shugarts, Hazeltine 1420 terminal, cables, manuals, 65U and CP/M. $400 - I'll ship. **904-681-3246, Dave.**

(117A) OHIO SCIENTIFIC COMPUTERS WANTED

(117B) OHIO SCIENTIFIC SOFTWARE, PERIPHERAL

(118) OSBORNE COMPUTERS FOR SALE

For an offer you can't refuse . . .
Godfather's used computer Syndicate

$$$$ I have Osborne computers for sale with 90 day warranty. Used-$500, New-$600, we also do upgrades. **Godfather's Used Computer Syndicate,** PO Box 3037, 1154 W. SR 436, Forest City, FL 32714. **305-774-1111.** 3-76

NEW Osborne MS-DOS SYSTEMS! Model 2100w/ Monochrome monitor, 2 floppy drives, MS-DOS 2.11, parallel card V20 (CP/M Software!) $1995. **Model 2110 w/Monochrome** monitor, 1 floppy drive, MS-DOS 2.11, Parallel Card, 10-Meg HD, V20 (Runs CP/M software!) $2495. **Model AT w/Mono Monitor,** 1- 1.2 meg floppy, Parallel Card, 512K, $2995. **Model AT-20 w/Mono Monitor,** 1- 1.2 meg floppy, Parallel Card, 512K, 20-meg HD $3995. Semi-kits Available- Trade-ins Accepted! Authorized Osborne Dealer! Visa/MC. **B Systems,** 3228 S. Boulevard, Suite 577, Edmond, OK 73013. **405-341-7437.**

OSBORNE COMPUTERS Portable, self-contained, 2 disk drives. Also, parts and software. **ISE,** Dept. 32, Box 8256, Brownsville, TX 78521. **512-831-9341.**

(118A) OSBORNE COMPUTERS WANTED

For an offer you can't refuse . . .
Godfather's used computer Syndicate

$$$$ I Buy, Sell, & Trade Osborne computers working or not. We also do upgrades. **Godfather's Used Computer Syndicate,** PO Box 3037, 1154 W. SR 436, Forest City, FL 32714. **305-774-1111.** 3-76

Paying $5.00 per pound for scrap tantalum capacitors. Any amount, fast payment! Ship: **Sciuto,** 103 Saratoga St., Lawrence, Mass. 01842. 9-79

(118B) OSBORNE SOFTWARE, PERIPHERAL

FREE OSBORNE software available through the Public Domain Users Group. Over 200 programs: games, (adventure, chess), utilties & specialty (Modm7, Database). For information send SASE to: **Public Domain Users Group,** PO Box 1442-C8, Orange Park, FL 32067. 1-75

OSBORNE EQUIPMENT Compac modem, unused, $50. Transtar 120P Daisy Wheel printer, unused, $150. Parallel printer cable, $10. Personal Pearl database program, $50. **301-721-2188.**

Osborne 1 with cables, Amdek 12" B/W monitor, DBASE II, Wordstar, MBasic, CBasic, SuperCalc, CP/M, $500. **801-753-0889.**

(120) MS/DOS COMPUTERS FOR SALE

CORONA 400 portable, two floppies, 512K, hi resolution graphics, Basic, DOS, $995. **212-580-0541** Arnold.

66% OFF

MAIL MERGE
STAR INDEX
SPELLSTAR
WORDSTAR

Attention IBM Wordstar Users: Up to 65% off: For IBM PC and Compatibles

Correctstar (updated Spellstar)- corrects spelling from 65,000 word dictionary; offers alternative words. Just type a word the way it sounds and Correctstar will find the correct spelling. (Note: program requires 192K RAM). **Starindex**- creates an alphabetized indices and tables of contents; **Mailmerge**- merges files for personalized form letters; assembles mailing labels. Starindex-list price is $99, our price is $75 (25% off); Mailmerge-list price is $99, our price is $75 (25% off); Correctstar-list price is $145, our price is $75 (64% off); Package of Mailmerge and Starindex-list price is $198, our price is $99 (50% off); Package of Correctstar and Starindex or Correctstar and Mailmerge-list price is $243, our price is $99 (60% off). All three packages-list price is $343, our price is $119 (65% off). **Call BCE,** 7 days a week, 24 hours a day. **1-800-545-7447.** See ad index for other BCE bargains!

For an offer you can't refuse . . .
Godfather's used computer Syndicate

$$$$ Dimension 68000 runs IBM, C/PM, C/PM-80, Apple II+, Kaypro, Cromerico, Unix, and Radio Shack software. 2 DSDD drives, 512K, 8 MZ. Clock, a true programmer's machine!! $1,499. 5 day warranty. **Godfather's Used Computer Syndicate,** PO Box 3037, 1154 W. SR 436, Forest City, FL 32714. **305-774-1111.** 3-76

Leading Edge PC $995 Complete w/20 Meg Disk $1495

Model "M", 256k, 2DD, monochrome monitor, serial and parallel ports, clock. MS-DOS, GW Basic, 1 year factory warranty - $995! 1 DD, 20 meg - $1495! Quantities limited. **BCE 1-800-231-3549.** See ad index for other BCE bargains.

SEEQUA CHAMELEON PLUS computer. IBM and CP/M compatible. Complete with bundled software, 256K RAM, and two double-sided disk drives. $1395. Call **Cliff at 509-525-2580.** 12-74

SLICER SINGLE BOARD COMPUTER, 8Mhz, 256K, 2 serial ports, 8" and 5" floppy drivers, SASI interface, MS/DOS 2.0, CP/M-86 1.1, $500. **Slicer PC Expansion Board,** lets Slicer run PC software, $400. **Call David 201-387-6948.**

(120A) MS/DOS COMPUTERS WANTED

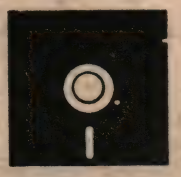
(120B) MS/DOS PERIPHERALS

66% OFF

MAIL MERGE
STAR INDEX
SPELLSTAR
WORDSTAR

Attention IBM Wordstar Users: Up to 65% off: For IBM PC and Compatibles

Correctstar (updated Spellstar)- corrects spelling from 65,000 word dictionary; offers alternative words. Just type a word the way it sounds and Correctstar will find the correct spelling. (Note: program requires 192K RAM). **Starindex**- creates an alphabetized indices and tables of contents; **Mailmerge**- merges files for personalized form letters; assembles mailing labels. Starindex-list price is $99, oru price is $75 (25% off); Mailmerge-list price is $99, our price is $75 (25% off); Correctstar-list price is $145, our price is $75 (25% off); Package of Mailmerge and Starindex-list price is $198, our price is $99 (50% off); Package of Correctstar and Starindex or Correctstar and Mailmerge-list price is $243, our price is $99 (60% off). All three packages-list price is $343, our price is $119 (65% off). **Call BCE,** 7 days a week, 24 hours a day. **1-800-545-7447.** See ad index for other BCE bargains!



TDK DSDD DISKS 59¢

High Quality TDK Diskettes with hub rings and sleeves. 200 disks for $130 (.65 ea), 400 disks for $252 (.63 ea) or 1000 disks for $590 (.59 ea). Add $8.00 per order shipping. **Call BCE, 1-800-545-7447, 24 hours.** See ad index for other BCE bargains.

(121) KAYPRO COMPUTERS FOR SALE

All used products over $100. Buy/sell through nationwide listing service. **NO CHARGE** for buying direct from owner. **NO RISK** for sellers - 6% commission when successful. Open 24 hours if you have a touchtone phone. **203-762-8677.**

COMP-USED
85 Rivergate Drive, Wilton, CT 06897. 3-76

BUY/SELL USED COMPUTERS
Quick/Easy/Best value ● Thousands of items ● For sale by owners ● National Listing Service ● No Commission ● Only $29.95 to list until sold!

1-800-TECTRAN
800-832-8726
VISA/MC Accepted ● 617-491-4888. 3-75

KAYPRO 4 $850. Kaypro 10 $1750. Both have DBASEII, Wordstar and bundled "Perfect" software + Public Domain. **Glenn Hoelscher,** Days 415-460-6310, Eves 209-239-5636.

KAYPRO COMPUTERS: must sell two Kaypro 4's, $750 each; two Kaypro 4-84's, $1,050 each; one kaypro 10, $1,850. All excellent, more than original software. **Terry Dunham, 1-800-344-6397.** 2-74

Kaypro IV all standard software and manual plus Smartkey. Excellent condition $700. **R. Rubin, 203-852-9618.** 2-75

68% OFF

1200 BPS Modem Liquidation
$189

USRobotics Password 1200/300 bps Modem. Autodial/Answer. Works with PC-Talk, Crosstalk and most other communications software. Works with IBM, Apple, Kaypro, etc. RS232-C male/female interface. Compact design. Add $5 per modem shipping. **BCE 1-800-545-7447** 24 hours. See ad index for other BCE bargains.

(121A) KAYPRO COMPUTERS WANTED

(121B) KAYPRO SOFTWARE, PERIPHERALS

$15 DRAWING PROGRAM! Little Artist That Can allow you to draw a 6x4" drawing with any CP/M Kaypro. A detailed section of the drawing is viewed while drawing, and a rough representation of the entire drawing is available at the press of a key. Works with Star Gemini and compatible printers. Simple, easy to use instructions. **Dennis Gimlin, Little Software That Can,** 7322 Oak Manor #37, San Antonio, TX 78229. 1-74

$29 ACCOUNTING SOFTWARE! Little Accountant Than Can maintains 100 personal or product accounts, prints statements, records expenses under 12 redefinable catagories, and prepares summary reports (instant tax preparation). Ideal for small and home-based businesses. Complied for CP/M Kaypros BASICA/GWBASIC and MBASIC versions for otherr computers. **Dennis Gimlin, Little Software That Can,** 7322 Oak Manor #37, San Antonio, TX 78229.

43¢/PROGRAM for the best 70 Kaypro Public Domain programs - including 16 games (adventure, blackjack), 40 utilities, 13 application programs and Modem7 (Kaypro version). Send $30 for 6 disk set. **Public Domain Users Group,** Box 1442-K1, Orange Park, FL 32067. 1-75

Custom Printer Characters. Design and use your own characters. For Epson FX printers and 84 series KAYPRO computers. Requires MBASIC. Disk and instructions $13.50pp. **Eric Campbell,** Box 893, Mackinaw City, MI 49701

KAYPRO 10 COMPUTER (cost $2,795/11-83). JUKI LETTER QUALITY PRINTER (cost $699/11-83). Programs: Perfect Filer, Writer & Calc; Wordstar; Micro Plan; Superterm; M Basic & Games; and C Basic & Compiler. EXCELLENT condition! Best offer gets all! Call anytime, answering machine. **1-619-455-0154.** Or, write NOW to: **Finney,** 7216 Enders Ave., San Diego, CA 92122.

68% OFF

1200 BPS Modem Liquidation $189

USRobotics Password 1200/300 bps Modem. Autodial/Answer. Works with PC-Talk, Crosstalk and most othe communications software. Works with IBM, Apple, Kaypro, etc. RS232-C male/female interface. Compact design. Add $5 per modem shipping. **BCE 1-800-545-7447** 24 hours. See ad index for other BCE bargains.

80% OFF

40 CPS Letter Quality Printer Liquidation $349

Wide carriage, 40 CPS daisy-wheel letter quality printer. Made by **C. Itoh.** For complete list of features and specifications, **see ad index** for full page display ad and other BCE bargains. **BCE 1-800-545-7447 24 hrs.**

QUERY III PLUS is: only $139.95, state of the art, third generation, plain english commands, menu driven, easiest to use, runs faster, sorts faster, not copy protected, 13 programs, 255 characters by 255 fields by 65,535 records limited by your storage, search on up to 40 conditions, create from letters and reports from one or many databases, default or custom mailing labels, programmable to perform a series of functions with one keystroke, perfect math, and much more. Plainly stated the ULTIMATE DATABASE MANAGEMENT SYSTEM on the market today for any amount! Reasonably priced for a limited time at $139.95 plus $3.00 shipping and handling. Specify CP/M format. **TARGET SOFTWARE,** PO Box 1846, Kernersville, NC 27285. 3-75

STAR ACCOUNTING PARTNER for Kaypro IV or II. Excellent full featured system. GL, AP, AR, PR. New, with full documentation. Retails for only $395. **505-983-7267.**

(123) SANYO COMPUTERS FOR SALE

SANYO 555-2, 256K RAM, 2 DS/DD drives and full software bundle $700 OBO. 14 inch NEC RGB Color Monitor, $250 OBO. **615-967-4460.**

SANYO MBC550 736kb expands to 960kb. Clock, Ramdisk, Spooler, 2-dsdd Teacs. Amber Monitor, Prowriterl. S/Ware incl. Wordstar, Calcstar, Easywriter, EasywriterII, Easyplanner, Easyfiler, MSDOS2.11, Manuals. $850. Bill **707-745-9171.**

Sanyo 555-2, 256k RAM, 2 DS/DD drives and full software bundle $700 O.B.O. 14 inch NEC RGB Color monitor $250 O.B.O. **615-967-4460.**

(123A) SANYO COMPUTERS WANTED

(123B) SANYO SOFTWARE, PERIPHERAL

NEWPOKER! five card draw poker game for Sanyo 550/555. Fast, lifelike graphic cards. One to six players. Bonus RAMTEST and collectors' Western record album. Send $25 to: **SOUNDS of the OLD WEST,** 3210 Terry Drive, Toledo, OH 43613.

OPUS

Are you tired of expensive terminal programs which don't work correctly on the Sanyo? Well, the OPUS series is for you. They are 'State of the Art' terminal programs written exclusively for the Sanyo 550/555. The OPUS series feature: Auto Logon, Auto Key, Xmodem, DC2/4, manual ASCII capture, full parameter control, disk utilities, on screen menus, windows, etc. OPUS 2 is for the standard Sanyo. OPUS 3 is for the Sanyo with Video Board. OPUS 2 and OPUS 3 with 41 page manual, $20 PP. **Bob Jack Software,** 8371 White Road, Burbank, OH 44214. 2-75

SANYO 555, Loaded. MSDOS, 512K, CRT-70 HiRes color monitor, video board, 2DSDD, clock, RS232. Sacrifice $1050. **616-774-8178. R. Gould,** 1060 N. Hampton NE, Grand Rapids, Michigan 49505.

★ ★ ★

"SANYO MBC 550/555 Beginner and Intermediate Guide." 360+ pages plus disk with 56 programs. $29.95 postpaid USA/Canada. VISA/MC Okay. **818-346-7024.** 3-76

Survey-Boundary 550/555 MSDOS 2.11 $29.95. Manual only $1.00. **P. Billings,** Dept. CSA, 12134 Bonnie Terr., Seminole, FL 33542. 1-77.

(125) SINCLAIR COMPUTERS FOR SALE

SYSTEM CHEAP! Used: ZX-81, 16K RAM pack, Aftermarket Keyboard, Radio Shack TRS-80 computer tape recorder, 40 column printer, software, 50+ magazines (some bound) — all for the price of the tape recorder. $75 or best Offer. **404-455-0780** Saturdays only. **Ronny Richardson,** 3356 Ann Street, Atlanta, Georgia 30341.

SYSTEM CHEAP! USED: ZX-81, 16K RAM pack, Aftermarket Keyboard, Radio Shack TRS-80 Computer Tape Recorder, 40 Column Printer, Software, 50+ Magazines (some bound) -- all for the price of the tape recorder. $75.00 OR BEST OFFER **404-455-0780** SATURDAYS ONLY. **Ronny Richardson;** 3356 Ann Street; Atlanta, GA 30341.

(125A) SINCLAIR COMPUTERS WANTED

(125B) SINCLAIR SOFTWARE, PERIPHERAL

2068 BANNERS with your 2040 printer. Includes alphabet, numbers, punctuation. Easy to run. Sample $2. SASE. Cassette $14.95 PP. **David Trevor,** Box 46208-T, Phoenix, AZ 85063. 11-78

CAI/O RS232 Interface and stringy floppy for ZX81 complete with manuals. Excellent condition $100. **Dave Frey,** 619 Avignon, Melbourne, FL 32935. 305-259-2625.

COMPUTER HARDWARE expansion projects you build yourself, our step by step manuals show you how. Catalog $2, refundable on first order. **KLUGE SYSTEMS,** PO Box 297, Little Creek, DE 19961.

Compusa disk Utilities. Add capability to copy disks, read fractional tracks, recover deleted files, more. SASE for information. **SiriusWare,** 6 Turning Mill Road, Lexington, MA 02173. 2-75

FREE CATALOG, Timex Sinclair 1000, 1500, 2068, **SPECTRUM** and **QL. Basically Programming,** Dept. C. 2528 W. Olive Avenue, Fullerton, CA 92633. 714-738-0666. 7-76

FREE PROGRAMS!!
Timex!1000/Timex-1500/Timex-2068/TI99-4A/Adam/all IBMpc's, Apples, Commodores, TRS80's. Send Stamps! **EZRAEZRA,** Box 5222-PFE, San Diego, CA 92105.

LAS VEGAS Games Package. Two programs: (1) Vegas 21 blackjack — Split Pairs, Double Down, Buy Insurance. (2) Lucky 7 Slot Machine — Three Wheels. Excellent graphics. Inserts coin, spins wheel, payoff money falls out. Listing $3. Third game free — while supply lasts. **M. Williams,** Dept. CS, 2935 Market, East St. Louis, IL 62207.3-76

PIXEL SKETCH AND GRAPHICS EDITOR 2068 VERSION 2.0 is an updated version of the original PS/GE 2068 with the same great graphic editor capabilities: Window COPY, ERASE, ROTATE, ZOOM, WIDE, MIRROR-IMAGE, PAINT, SHADE, INVERT, and DIGITIZE in the Standard and Extended Color (Extended Color gives 8 times the standard color resolution) video modes. Merge parts of two screens into one screen. Full use of INK and PAPER colors, bright and flash. DRAW and CIRCLE commands too! Also uses the hi res (64 column) video mode for 512x176 draw and print. new functions include a CONNECT function to connect designated points. TEXT Mode expanded to include 4 print fonts (standard, bold, modern, or italics), or load your own fonts! The plot function has been speeded up too (2 to 3 times faster!). Easy to use, fully menu driven. Joystick controlled. Fully documented. Full size printer compatible. Works great with the TASMAN Grey Scale Copy code. Instructions to implement your interface code. Comes with Tasman CPI code written to access the variable dot density functions of Star and Epson type printers to control page size and placement (left, center, right justify). Star SG-10 can produce 12 sizes. Get the NEW Pixel Sketch and Graphics Editor Version 2.0 now. Still only $19.95. If you bought the original PS/GE, send the tape as proof of purchase and pay only $10.95. Only from: **Lemke Software Development, 2144 White Oak, Wichita, KS 67207.** Send business SASE for LSD catalog of top quality programs for the TS 2068.

QL CATALOG

SOFTWARE-HARDWARE-BOOKS-MAGS Q-DISK Interfaces, disk drives, monochrome mon. cables, printers, Centronics interfaces. **Software: ZKUL, WEST, GRAPHIQL WD** Utility, PASCAL, FORTH, BCPL, Assemblers, Blackjack, **QL,** Diary, **AND MUCH MORE.** Write for **FREE CATALOG** to: **CURRY COMPUTER,** 5344 W. Banff, Glendale, AZ 85306, 1-602-978-2902 11-75

QL CATALOG

SOFTWARE-HARDWARE-BOOKS MAGS-ACCESSORIES. We are an **authorized Sinclair dealer-QL-Flat screen TV-QL/SW Disk interfaces, RAM expansion,** printers, Centronics interfaces. **Software: I.C.E., GRAPHIQL, ZKUL, SUPERCHARGE COMPILER, CONCEPT 3D,** assemblers, graphics and business packages, games and utility software, Sinclair Research software. **And Much, Much more.** Write for **Free Catalog** to: **Curry Computer,** PO Box 5607, Glendale, AZ 85312-5607. 1-602-978-2902. **Open** 7:00 am to 5:00 pm MST M-Sat. **Open Till 9:00 PM MST Tue. & Thurs.** 3-77

★ ★ ★

QUICKEY 2068. Increase memory when using TASWORD II and or TASPRINT. Customize your TS with a durable keyboard overlay gives you instant reference. Also avail. for MSCRIPT. Send check or M.O.. $3.99 + $.50 shipping & handling to: **AN-TO Productions C.,** 9009 W. Elm St. #2, Phoenix, AZ 85037.

★ ★ ★

SINCLAIR QL $299. QL-Monitors, QL-Printers, Books, Software. Also: for TS 1000/ZX81 Memocalc $29. Memotext $29. Memotech Centronics Interface $59. Software for MTX-512. **Brice Road Pharmacy,** 1653 Brice Rd., Reynoldsburg, Ohio 43068. 614-861-3600. 3-76

Survey-Boundary program Sinclair T/S 1000 $19.95. Manual only $1.00. **P. Billings,** Dept., CSC, 12134 Bonnie Terr., Seminole, FL 33542. 1-77

THE QL REPORT

A MONTHLY NEWSLETTER published in the U.S. for QL owners and those interested in the QL. Software reviews, books and hardware reviews, interviews with programmers and QL companies — and more. $15 for 12 issues. Published by: **Curry Computer,** PO Box 5607, Glendale, AZ 85312-5607, **1-602-978-2902.** 3-79

TIMEX 16K expanders, never used, $15 each plus $3 shipping. **J. Brosky,** 5980 Lannoo, Detroit, MI 48236. 3-75

TS1000-Adventurer's (16K RAM) all new adventure-Survival game with a twist (The Island) the twist is if you survive (make it to the end) you will find a secret number. Send this number to us and we will issue a verified survival certificate. Each game costs $10.00 on cassette (postage included). California Residents add 6% tax. To order or for free literature write: **O.F.A.,** P.O. Box 235, Oakdale, CA 95361. 1-77

TS1000-Adventurer's (16K RAM) all new adventure-Survival game with a twist (The Island) the twist is if you survive (make it to the end) you will find a secret number. Send the number to us and we will issue a verified survival certificate. Each game costs $12.00 on cassette (postage included). California Residents add 6% tax. To order or for a free borchure write: **O.F.A.,** PO Box 235, Oakdale, CA 95361

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(126) MISCELLANEOUS MICROCOMPUTERS

★ ★ ★

All used products over $100. Buy/sell through nationwide listing service. **NO CHARGE** for buying direct from owner. **NO RISK** for sellers - 6% commission when successful. Open 24 hours if you have a touchtone phone. **203-762-8677.**

COMP-USED

85 Rivergate Drive, Wilton, CT 06897. 3-76

B&C MICROSYSTEMS Universal E(E)PROM programmer, with RS-232 interface. Programs 874X series up, and supports devices up through 512k BITS. $275. **216-486-0823.** 3-75

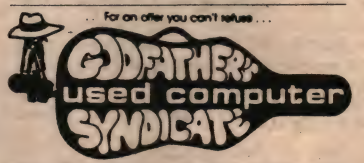
EPSON QX-10 w/Titan IBM card, Valdocs 1.9 and 2.0, Peach Business Software, complete manuals, CP/M, MSDOS and more, $1500. **515-472-4507.** Christopher Dennen, PO Box 1873, Fairfield, IA 52556.

EXIDY Sorcerer owners, compiling sorcerer user directory, send name and address to: **Cyberco,** Route One, Box 748, Cropwell, AL 35054.

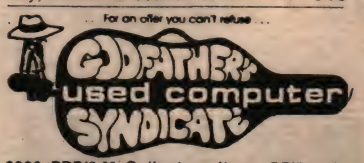
Eagle PC complete matched set, 256K keyboard monitor CPU GWBasic, Eagle Cal writer DOS, will sell as complete unit only! Less than 5 hrs. operating time $1800. **Dan Domeracki,** 5617 Louise Way Dr., Arlington, TX 76017. 1-76

Fortune 32:16 System 10 Mini-computer, multi-user Unix operating system, .75 MB RAM, 10 MB HARD drive, supports 5 users/devices can support up to 9 users/devices, console terminal. Acounting and word processing software included - needs repair. $2000 or best offer. Expansion cabinet w/power supply 45MB & 20MB HARD drives. Good condition. $1800. Hayes 1200 Smartmodem, like new, complete $300. Print spooler for serial port printer, 64K $125. **Call Larry at 813-441-3850.**

GRID Compass with 2102 Floppy drive. New with Grid Management System. $4,000 O.B.O. **312-295-5770 R. Tucker.** 3-75



$$$$ Onyx Sundance model C5000T with tape and hard drive $499 NO warranty, but works. **Godfather's Used Computer Syndicate,** PO Box 3037, 1154 W. SR 436, Forest City, FL 32714. **305-774-1111.** 3-76



$$$$ PDP/8-M Collectors Item. CPU only $199 NO Warranty. Looks really good on your bookshelf though!! **Godfather's Used Computer Syndicate,** PO Box 3037, 1154 W. SR 436, Forest City, FL 32714. **305-774-1111.** 3-76

New MiniTower $5378; Tower XP $13700; 84MB add-on disk $7655. FC, CCR. Other units available. **Call 813-442-9967.** 3-75

ONYX 8001MU complete 4 user multi-user system. 256 KB memory, 40MB Winchester disk with streamer backup tape, 4 Hazeltine Esprite video terminals, 1 Okidata Microline 83 serial priner, Basic interpreter and compiler, assembler, editor, MBSI General ledger, MBSI Accounts Payable, MBSI Accounts Receivable, Pyroll, Data Entry and misc. other utilitiy software. Also includes full documentation. $9500 or BEST OFFER. **Phone 303-598-4768.** 3-75

S-100 CP/M Computer System. Advanced digital Super Six 6MHz Z80 single board computer, two Shugart 8" S.S.D.D. disk drives with enclosure and power supply, T.E.I. 12 slot mainframe, Heath H-19 terminal. Manuals and software included. $1449 or best offer. **216-486-0823.** 3-75

Sage II computer, 512K RAM, dual 640K floppies, P-system OS. Asking $1500. **John T. Hughes,** 580 Campbell Blvd., Getzville, NY 14068. 716-689-8637. 2-75

★ ★ ★

Single Board 6502 Computer Kits – Bare Boards (no parts) with instructions and sample software. Ideal for small control computers, burgler alarms, printer controllers, etc. 4K EPROM, 4K RAM. Clock speed from 500Khz to 4Mhz, 20 I/O lines, requires about 200ma at 8 to 15 VDC. Recommended for the experienced builder. $4.00 each or 3 for $10.00, add $2.00 shipping and handling per order. V-MC-COD-check, COD add additional $1.50. Allow 4 weeks for delivery. Send orders to: **SBC KIT,** PO Box 2188, Melbourne, FL 32904 or call **305-723-1895** after 5pm EST. **NO COLLECT CALLS.**

TELEVIDEO COMPUTERS complete networks or individual units at approx 50% of dealer cost. Complete warranty. TS801 w/8in. drive, TS 800, TS 800A, TS 802H/20, TS 803, TS 806/20, TS 816/40, TS 816H/40, 6 USER REMOTE UNIT, CORONA portable XT compatible - $1,600, Apple II+ loaded - $1,000, 100 8in. disks $30. **303-449-4897/443-4681.** 3-75

*** Televideo * TS-802** 5¼" Double disk drive system. Like new. CPM operating system $1200. Contact **Dick Frederico 303-544-2744.** 3-75

VECTOR GRAPHIC 2 VSX-3000 micros each with 236K add'l RAM; 10Mb hard disk; 714K Floppy drive; keyboard; LINC network board. One year old. Including CCP/M-86; MS.DOS; Vector software including word-processing, spreadsheet, graph, and communications; database software. All for $10,000 obo. Each machine sold separately for $4,000 without software. **Bruce Powell,** 16255 Ventura Boulevard, Encino, CA 91436, **818-986-4727 days.** 2-76

★ ★ ★

WANTED: NETRONICS R&D explorer, any level to 'D'. **504-383-1111 ext. 163, 9-3.**

XEROX PORTABLE computer LCD display modem, software included, $200. Dual drives for above $200. Dual 8" double sided system, CCS controller, $350. S-100 harddisk and controller $200. **501-427-5425.**

Z80 BASED CP/M MICROCOMPUTER, 64K, 2 SS/DD 8" floppies, multiport board, 32 by 64 character video board, composite monitor, Wordstar, Supercalc II, Nevada Basic, Fortran, Cobol, $550. **Call David 201-387-6948.**

(127) XEROX COMPUTERS FOR SALE

4MHZ Xerox 820 with two 8" drives, power supply in rugged cabinet includes keyboard and box of ten "USED" disks $350. FOB **H. Chiv,** 10137 Pasture Gate, Columbia, MD 21084. **301-997-5700 evenings.**

Xerox 820-1 dual 5¼ drives, 2 monitors software $375. Call evenings: **Dick Barney 607-776-3935,** Bath, NY

(127A) XEROX COMPUTERS WANTED

(127B) XEROX SOFTWARE, PERIPHERAL

— BIG BOARD BUILDERS —

KEYBOARDS $25. See "APPLE BUILDER KEYBOARD" ad in category 108 for a super, full ASCII, 83 key keyboard which also works great with the Big Board/820 series computers. Thanks, **Electrovalue Industrial.** 12-82

PRODUCE YOUR own flight plan. Custom navigation program for Xerox or Big Board users. SASE for details. **G.T.L. Labs,** 1890 West Hillcrest #521, Newbury Park, CA 91320. 12-75

Wanted: Xerox 820-11 operating system software. Need 16/8 CP/M, and MS-DOS, Other software also. Disk alone OK. **Joe Drumsta,** 3102 S. Home, Berwyn, IL 60402. **312-484-7081** after 6 and weekends.

(128) MISC. MICRO, SOFTWARE, PERIPH.

5 MEGABYTE Hard Disk Drives, 2 for $100. These are 8" SA1002 Shugart Winchesters. Controller kit $200. Will interface to most computers: 6809, Z80, STD, S-100, Flex, CP/M, Apple, Heath. Call **Digital Search,** 803-877-9444.

★ ★ ★

For Sale: Compupro S100 cards & std. original CPM86 software for 30-50% off original price. M Drive H (512k), RAM21 (128k), SuperCalc II, Dbase II w/tutorial & screen editor, Uniforth, Vedit plus Editor, Oasis Word Plus Spell chk., Micro script/ed formatter/editor, 2500 AD macroassembler, DR Cbasic interpreter, Cbasic compiler, Computer Innovations C86 compiler. **Call Doug-evenings 919-828-6815.** 3-75

Tektronix 8560 Development Systems Assembly Language Software; 68000/68008 M68K Series $200. **203-755-1180.**

WHY PAY DOUBLE? CLONE/MS-DOS Software for $3/DS-DD DiskFULL (including disk). **804-851-6864, Colony,** Box 808, Langley AFB, VA 23665.

XB DETECTIVE 99 New debugging utility with Assembly Language speed. Resides in memory with XBASIC program, runs at any time with FCTN-7. Menu driven. List and search for variables, reserved words. Delete lines, string search. Hard copy option. Requires: XBASIC, 32K, Disk Drive. **Utilitee Software,** PO Box 7275, Dearborn, MI 48121. $19.95 (includes postage). Check or money order. Dealer inquiries welcome.

dBASE II/III, WordStar letterhead logo graphics strategies with most printers. Single or multipage report headers. Source code, documentation, $7.95. **Harvey Gardner,** PO Box 340 Huntington, NY 11743

(129) S-100 COMPUTERS

★ ★ ★

COMPLETE S-100 SYSTEM. Jade 2/4MHz Z80 CPU. Computine 5"/8" DS/DD FDC. Supports many popular 5" and 8" for-

mats, ideal for 8" to 5" file transfers or 16 bit upgrade. Digital Research 64K SRAM. SSM 2SIO-4PIO I/O board. Complete with PS, enclosure, and software library. Shugart 850 8" DS/DD drives with PS and enclosure. No reasonable offer refused. **215-782-1452, evenings.** 2-75

DUAL SYSTEM 83 20 slot S-100 w/68000, Interfacer-1 (2 serial ports), 16k RAM, 16k EPROM, Macsbug monitor, RT-11 hosted cross assembler, documents. Make offer. **Perry 212-505-7542.**

FOR SALE: IMS 5000 S-100 Turbo-dos multi-user computer. Includes master, (2) terminals with slave cards, (2) 5¼" floppy disk drives & 24mb hard disk, business software. Excellent condition. Call with offer. **RaviHar Khalsa,** Rt. 3, Box 137, Espanola, NM 87532. **505-753-9441.**

★ ★ ★

For Sale: Compupro S100 cards & std. original CPM86 software for 30-50% off original price. M Drive H (512k), RAM21 (128k), SuperCalc II, Dbase II w/tutorial & screen editor, Uniforth, Vedit plus Editor, Oasis Word Plus Spell chk., Micro script/ed formatter/editor, 2500 AD macroassembler, DR Cbasic interpreter, Cbasic compiler, Computer Innovations C86 compiler. **Call Doug-evenings 919-828-6815.** 3-75

GOLD! - Recover pure gold from old scrap circuit boards, electronics, etc. Very easy. My book tells how. Send $25. **J. Sciuto,** Box 129, Methuen, MASS 01844. 5-75

Ithaca InterSystems Computer boards: 256k memory $400, VIO $150, FDC2 $225, XPU $300, HDA $250, 6S10 $225. **Frontenac Designs, 607-387-5303.** 3-76

Ithaca Intersystems DPS-1 mainframe, 8080A CPU, 64K RAM, PMMI modem, Interfacer 2, Screensplitter 86 x 40 video system with keyboard, 2 8" DS/DD drives, Diablo 1640 printer & wood stand, Wordstar, Pascal/MT+, many disks/ribbons. Great word processing system. $1800. **Jeff Duntemann 301-576-0770 days.**

Musys Multiuser System. Musys 3 user Systems with 2-30 mB hard disks, 1-1.2 mB floppy, 3 Televideo 925 terminals Turbodos operating system, communications software, cables and dust covers. $5,000. **Paragon Computer Corporation, 203-525-0389.** 3-76

S-100 CARD SALE!!

S-100 ENTHUSIASTS! Write the S-100 BOARD BANK for savings on USED items. Subscribe to THE STATEMENT, the irregular, official organ of THE S-100 BOARD BANK. Send $4.37 or more to **S-100 Board Bank.** Mailorder Dept. C2, Box 344, Olympia, WA 98507. 1-77

S-100 SYSTEM HARDWARE. IMSAI 22-slot full front panel chassis w/PS, TDL 4MHz Z80 ZPU; TDL SMB monitor board w/2S+P, Cormemco Bytesaver PROM burner, 8" SSSD Drive (controller, cabinet, PS), extra 8080 CPU card, scientific calculator card, 6 cards with 44k SRAM; 16k PROM board, extender board w/Logic Probe, Terminator, Documentation, extras, $500. With like new terminal $650. F.O.B. **Barry Jones,** 23 Vesta, Fredericksburg, VA 22405. **703-371-3616.**

Teletek FDC-1, Compupro RAM16/64K memory, integrand main frame, QUME 102 VDT, dual 1.2MB Tandon disks. *Complete Documentation* Complete Business software plus languages $1800 O.B.O. **916-363-8144.**

WANTED: 68000 Operating System!! CP/M68K OK, prefer multitasking. Need assembler, languages, good 68000 editor; docs, software for Cromeco DPU Z80/68000. Have many S-100 cards, controllers-am flexible. Must be cheap, trade. **S-100 BOARD BANK,** Box 344, Olympia, WA 98507. 3-75

WANT S-100 CARDS!

BOARD BANK BUYS 'EM ALL! (Well, almost.) ROM, RAM, CPU, VIDEO, GRAPHICS, I/O, AD/DA, FDC, HDC, SPEECH, the uniquer the better! Convert your extras to CASH. We buy SYSTEMS, peripherals too. Send FULL description and CHEAPEST asking PRICE to **S-100 BOARD BANK,** Mailorder Dept. C-2, Box 344, Olympia, WA 98507. 1-77

Wanted: ProComp software for Teletek SysteMaster. **Jack Tawil,** 41 Vista Ct., Richland, WA 99352. **509-375-6237.**

(130) S-100 COMPATIBLE, PERIPHERAL

2 LSI Shuggurt 801 disk drives, $100 each; 1 well used, but running Televideo 920 terminal $75; 1 new televideo 920 terminal $175. Call **715-723-1925 after 5:00 pm ask for Doug.** 2-76

5 MEGABYTE hard disk drive subsystem for all S-100 systems. Kit $450. **Digital Search** 803-877-9444.

8K STATIC RAM $25. 2-Calcomp 142 8" w/Imsai case, $225. 2-Calcomp 140, w/case $200. 1-Adds Regent 60 CRT $225. Centronix 781 printer $85. **615-355-1061.** Jim Carroll, 304 Lexington Dr., Smyrna, TN 37167. 1-77

EPROM programmer by Ackerman Digital, will burn all 1-2-4-8k EPROMS, with software and docs. $250 OBO. **215-782-1452, evenings.** 2-75

VIASYN/COMPUPRO S-100 boards, used, working, most are current rev. level, all with warranty. CPU85/88, CPU8086, or CPU68K $200 ea, CPUZ $125, Interfacer1 or 2 $100 ea, Interfacer4 $225, Disk1 $175, Disk2 $200, Disk3 $325, Sys Support1 $225, RAM17 or RAM16 $175EA, RAM20 $100. Compupro system enclosure $500. Drive enclosure also available. Special pricing on brds. with purchase of disk drives, see Ad heading #172 Disk Drives. Also some unused boards available. Call **714-820-1258,** or write **Michael Louie,** 1118 Lancewood Ave., Rialto, CA 92376. 3-75

(131) S-50 COMPATIBLE, PERIPHERAL

5 MEGABYTE hard disk add-on for SS-30 or SS-50 from $450, with software and interface. **Digital Search,** 803-877-9444.

(132) HEATH COMPUTERS FOR SALE

H89 Computer 4mhz, SuperDG, 256K, two 48TPI internal, one 96TPI external, amber screen, three serial ports, extra CPU board, misc spare parts, CP/M, ZCPR2, Fortran, Wordstar, SuperCalc, Turbo Pascal, more. All manuals. $1300. **C.M. Floyd 913-682-0845 evenings.**

Wanted: Z-89-37 soft sector disk controller board. Must be reasonable. **209-951-4451.** 3-75

(132A) HEATH SOFTWARE, PERIPHERAL

5 MEGABYTE add-on hard disk subsystem for Heath-89. Kit $475. **Digital Search,** 803-877-9444.

(133) BURROUGHS SYSTEMS

BURROUGHS B-92-CSY, 3/6 MB inbuilt mini disk, 38.7 MB fixed disk, memory upgrade 128 to 256, two peripherals. Reasonable offer. Contact **Charlotte 205-556-1943.**

(134) HEWLETT PACKARD COMPUTERS FOR SALE

BUY/SELL USED COMPUTERS

Quick/Easy/Best value ● Thousands of items ● For sale by owners ● National Listing Service ● No Commission ● Only $29.95 to list until sold!

1-800-TECTRAN

800-832-8726

VISA/MC Accepted ● 617-491-4888. 3-75

Floor models for sale, new with factory warranty. 110 Portable $1795; 150B dual floppy $1995; 71B $365; 12C $88.95; 82161A Cassette Jr. $365. **Chips Computers Plus,** 3611 Sycamore Dairy Rd., Fayetteville, NC 28303. **919-864-5606.**

HP110 Portable Computer 272K RAM and 392K ROM. With auto-dialing internal modem. With internal Lotus. With battery powered 710K double side disc drive. With extra software and 20 discs. With Silver-Reed EXP 550 letter quality printer. like new condition. new cost $4615, Price $2325. **Claude S. Sutton, Jr.,** Rt. 4, Box 183, Reidsville, NC 27320 **919-951-2707.**

HP110 Portable complete. Neve used with carrying case - charger - Lotus 1-2-3- built in modem, etc. **516-266-2424 ask for Bruce.**

★ ★ ★

HP110 Portable Computer, new battery, Edisk, built-in modem, ROM-based Lotus 1-2-3, word processor, includes BASIC with compiler, Thinkjet printer, 3.5" disk drive, many extras $3500. **Gregory A. Harrison,** PO Box 10574, Daytona Beach, FL 32020.3-75

HP-150 with 15MB hard disc. All software imaginable. Must sell now. Touch screen. One owner. Perfect shape. $2800 firm. Call **501-377-2093 now.**

HP-85 Excellent cond. $575. All HP-85 Software 60% off. List: **Terry 313-528-1571** or write PO Box 1034, Troy, MI 48099. 3-75

HP 87A, 96K, CP/M Module, 300 baud Modem, 5¼" dual Disc, printer, software, Excellent condition – $2500. **G. McKenzie,** 4633 Holly Drive, Palm Beach Gardens, FL 33418. **305-627-3411.**

HP Integral PC, 786K RAM, Basic compatible with series 80, UNIX operating system, $4000. **615-525-6358 leave message.**

For an offer you can't refuse ...
Godfather's used computer SYNDICATE

$$$$ HP-75C 16K $200 delivered with case. **Godfather's Used Computer Syndicate,** PO Box 3037, 1154 W. SR 436, Forest City, FL 32714. **305-774-1111.** 3-76

(134A) HEWLETT PACKARD COMPUTERS WANTED

For an offer you can't refuse ...
Godfather's used computer SYNDICATE

$$$$ I buy, sell & trade Hewlett Packard Computers. **Godfather's Syndicate,** 1154 W. SR 436, Forest City, FL 32714. 305-774-1111. 1-76

For an offer you can't refuse ...
Godfather's used computer SYNDICATE

$$$$ I Buy, Sell, & Trade Hewlett Packard computers. **Godfather's Used Computer Syndicate,** PO Box 3037, 1154 W. SR 436, Forest City, FL 32714. **305-774-1111.** 3-76

(134B) HEWLETT PACKARD SOFTWARE, PERIPH.

HP-150 SOFTWARE 'Original' with manuals. Lotus 1-2-3, $95. Memomaker $35. Graphics $75. Wordstar $95. Terminal & Owners Guide $25. HP-100 Microplan $75. CA **415-499-8101.**

★ ★ ★

HP2686A LASERJET printer, used one month. Original warranty. Will sacrifice $2100. Call **Bob 713-387-4450.**

HP-75 TAX Preparation Software-1985. Used commercially by former IRS auditor. TAXCOMP menu-driven federal tax calculator (integrated Fed & NYS/NYC version also available (for every filing status.) INCAVER integrates w/TAXCOMP for Sched G—scrolling line by line display. HP-75 Visicalc templates for 1040, Sched A, Sched G, and integrated NYS IT-201 and IT-250 also available. Non-tax programs available include ORDANN (emulates HP-12C top row), and OPVAL (Black & Scholes option valuation). SASE for brochure. TAXCOMP $12 or both $17 for cards & docs. Add-Post-AP **Pat Cully,** 410 Richmond Ave., Maplewood, NJ 07040.3-75



TDK DSDD DISKS 59¢

High Quality TDK Diskettes with hub rings and sleeves. 200 disks for $130 (.65 ea), 400 disks for $252 (.63 ea) or 1000 disks for $590 (.59 ea). Add $8.00 per order shipping. **Call BCE, 1-800-545-7447, 24 hours.** See ad index for other BCE bargains.

STOCK MARKET programs for HP 86/87 computers. Powerful programs for selecting and evaluating stocks and commodities. Send $39.95 to **Lock Software,** Box 3163, Baltimore, MD 21228. Specify disk size. 9-79

(136) DATA GENERAL SYSTEMS

Great Opportunity! Data General One Like new: IBM Compatible, 256K, two disk drives, adjustable tilt screen, soft carrying case. SACRIFICE $1700. Call Days **516-466-6550.**

(138) DATA GENERAL, SOFTWARE PERIPH.

(148) DEC SYSTEMS FOR SALE

★ ★ ★

All used products over $100. Buy/sell through nationwide listing service. **NO CHARGE** for buying direct from owner. **NO RISK** for sellers - 6% commission when successful. Open 24 hours if you have a touchtone phone. **203-762-8677.**

COMP-USED

85 Rivergate Drive, Wilton, CT 06897. 3-76

DEAD PARTS WANTED LIVE PARTS FOR SALE

ERM buys and sells electronic material. We pay immediate cash for printed circuit boards, IC's, relays, contacts, transistors, connectors, switches, keyboards, card cages, LED's, and computers ... DEAD OR ALIVE. Call **"Digger" at 617-662-9363.**

★ ★ ★

DEC Hardware Liquidation Closeout Prices!

Rainbow (100B - Demo)	$1450
Rainbow (100A - Demo)	$900
Rainbow (100A - Used)	$750
LA100 (Demo)	$650
LA100 (Used)	$550
LA100 Tractor feed	$79
LA50	$249
DF03-AA Modem	$169

Quantities Limited! **BCE 202-944-3900. See ad index** for other BCE bargains!

DEC PRO350, 768k, Bit-Map, FPA, 10mb, Floor Stand, POS2.0 TK!, MAPS Financial, $3,500 O.B.O. **312-295-5770 R. Tucker.** 3-75

DEC Pro350 system w/512k, 2 drive, 10M HD, floating point adapter, LA50 printer, Mono monitor, cables. List $7940, ask $4400. W/Comm. software $4500. **714-627-7411 Ken.** 2-75

★ ★ ★

DEC Rainbows 100B 128-893K, CPM/DOS, some graphics, color, large amount of software. Start at $1800. **305-777-4663 or 773-3417.** 1-75

MICROVAX-New systems with 190mb disk, reel-to-reel tape available and Decnet. Call for specifics. **301-490-3608.** 1-77

PDP11/23 SYSTEM 160kb, MMU, FPU, floppy, 10mb disk, multiple ports, terminals, printers, spares, DEC installation, $9000 complete. Ideal for laboratory/educational applications. **Phylan Incorporated,** 614-846-6248. 3-75

RAINBOW 100 memory board with 128K, Select-86 word processing software, PASCAL, and Poly-Com Communications software. Will sell individually at any reasonable price. **315-652-6219.**

(149) DEC SYSTEMS WANTED

(150) DEC SOFTWARE, PERIPHERAL

★ ★ ★

DEC Hardware Liquidation Closeout Prices!

Rainbow (100B - Demo)	$1450
Rainbow (100A - Demo)	$900
Rainbow (100A - Used)	$750
LA100 (Demo)	$650
LA100 (Used)	$550
LA100 Tractor feed	$79
LA50	$249
DF03-AA Modem	$169

Quantities Limited! **BCE 202-944-3900.** See ad index for other BCE bargains!

DEC LSHI System. Serial interface, terminal, 32K memory, disk controller, printer interface. Asking $1000. Call **301-795-4614** after 8PM EST.

Q-BUS COMPONENTS: DEC BA11-UA box (three 4x4 backplanes) $110. Heath H-11 box (one 4x4 backplane) $75. National NS23M 256K RAM board, $200. Serial Interfaces Heath WH-11-5, $35 ea. RX01 Equiv. controller and interface for Shugart 8in. drives, $200. Winchester controller and interface $240. Heath H-10 paper tape unit $40. **David Dixon,** 3208 Jupiter Rd., Las Cruces, NM 88001. 505-522-0596.

Virtual Microsystems MS-DOS and CP/M Z-Chip for DEC PRO350. Includes Board, adaptor and software. $1,300 O.B.O. **312-295-5770 R. Tucker.** 3-75

(154) IBM SYSTEMS FOR SALE

★ ★ ★

All used products over $100. Buy/sell through nationwide listing service. **NO CHARGE** for buying direct from owner. **NO RISK** for sellers - 6% commission when successful. Open 24 hours if you have a touchtone phone. **203-762-8677.**

COMP-USED

85 Rivergate Drive, Wilton, CT 06897. 3-76

DEAD PARTS WANTED LIVE PARTS FOR SALE

ERM buys and sells electronic material. We pay immediate cash for printed circuit boards, IC's, relays, contacts, transistors, connectors, switches, keyboards, card cages, LED's, and computers ... DEAD OR ALIVE. Call **"Digger" at 617-662-9363.**

(155) IBM SYSTEMS WANTED

For an offer you can't refuse ...
Godfather's used computer SYNDICATE

$$$$ I Buy, Sell, & Trade IBM PC's. We may have a large quantity of them coming shortly. **Godfather's Used Computer Syndicate,** PO Box 3037, 1154 W. SR 436, Forest City, FL 32714. **305-774-1111.** 3-76

Paying $5.00 per pound for scrap tantalum capacitors. Any amount, fast payment! Ship: **Sciuto,** 103 Saratoga St., Lawrence, Mass. 01842. 9-79

(156) IBM SOFTWARE PERIPHERAL

AMERICAN HOLIDAY etc: highest score fast, accurately using your IBM and our software. SASE to: **Computer Masters,** Box 652525, S. Miami, FL 33265-2525. 3-75

FREE SOFTWARE NEWSLETTER packed with PC bargains. $18/yr individual $3/sample. PC FREE. **Box 300-S,** Harrods Creek, KY 40027. 3-76

★ ★ ★

GREAT SOFTWARE - INEXPENSIVE FIVE + CASINO GAMES IBM-PC or Compatibles, No Graphics needed. Send $19.95, PP California Res. add 7% tax. **TRIABYT COMPUTER SOFTWARE,** 1890 Crater Lake Ave, Milpitas, CA 95035. 3-79

IBM COLOR Graphics Monitor adapter for PC $85. Monochrome display and printer adaptor $110. Both items new. **Dave Frey,** 619 Avignon, Melbourne, FL 32935. **305-259-2625.**

PUBLIC DOMAIN software for the IBM PCjr. Sample disk $6. Free list. **RPM,** Dept. A, 2019 Foucher, New Orleans, LA 70115.1-74

PUBLIC DOMAIN software for the IBM PCjr. Sample disk $6. Free list. **RPM,** Dept A., 2019 Foucher, New Orleans, LA 70115

QUERY III PLUS is: only $139.95, state of the art, third generation, plain english commands, menu driven, easiest to use, runs faster, sorts faster, not copy protected, 13 programs, 255 characters by 255 fields by 65,535 records limited by your storage, search on up to 40 conditions, create from letters and reports from one or many databases, default or custom mailing labels, programmable to perform a series of functions with one keystroke, perfect math, and much more. Plainly stated the ULTIMATE DATABASE MANAGEMENT SYSTEM on the market today for any amount! Reasonably priced for a limited time at $139.95 plus $3.00 shipping and handling. Specify MS-DOS, CP/M format, H-DOS and Z-DOS. **Target Software,** PO Box 1846, Kernersville, NC 27285. 3-75

TEACHER WANTS to trade IBM, Apple, C-64 Public Domain. Trade even or I'll send 2 blank disks for each. Want Mumps. SASE appreciated. Fractions Add/Sub Tutor (IBM disk, Coco Tape) $10. **T. McIlugg,** 225 W. May, Las Cruces, NM 88005.

TECMAR "Graphic Master" high resolution video board. Was in use for only 3 weeks! I paid $545 for it. Call me with best offer. **Moshe, 714-956-7320.** 3-75

USED SOFTWARE original disks and manuals. Alpha Software Database Manager II, The Integrator $120. (List $295), Interface Technologies Modula-2 M2SDS-XP $110 (list $277.88), Human Edge Mind Prober $20. Morgan Computing Professional Basic $85 (list $149). Also, will trade for dBASE III compiler. BOOKS: one copy Graphics for Epson Printers, Epson Printers for Writers, $10 each. PRINTER: Gemini 10X $150 (one year old). **404-455-0780** Saturdays only. **Ronny Richardson,** 3356 Ann Street, Altanta, Georgia 30341.

(166) MISC. (HARDWARE & SOFTWARE)

Basic A 2.0 user manual by Columbia. 10 day money back guarantee. $21.95 + $3 postage. **Dave Gillespie,** 1331 N. Lotta Dr., Los Angeles, CA 90063. 2-75

MODEL APCH02, Monochrome monitor, 128K RAM, dual megabyte drives, communication controller, printer controller, auto-power-off, 4K CMOS RAM hardware disk calendar, bundle software. Phone **216-844-8995** 8am-5pm. **Thomas Reidy,** 2105 Adelbert Rd., Cleveland, OH 44106.

(172) DISK DRIVES

10 MEG full height Winchester disk drive. CMI 5412 ST506 interface tested and guaranteed 90 days, $210. **Cascade Electronics, Inc.,** Route 1 Box 8, Randolph, MN 55065. 507-645-7997.

20 MEG full height Winchester disk drive Rodine 204 ST506 interface, tested and guaranteed 90 days, $310. **Cascade Electronics Inc.,** Route 1 Box 8 Randolph, MN 55065. 507-645-7997.

8" DSDD ½ height Shugart MOD SA 860-1 unused condition with full one year warranty. Price $279. These drives have track to track access times of 3MS. They will work as replacements for Shugart 800, 801, 850, 851. They require no AC to operate. **CEC,** 1745 Adrian Rd., Burlingame, CA 94010. 800-228-3411.

8" DSDD ½ height Shugart MOD SA 860-1 unused condition with full one year warranty. Price $279. These drives have track to track access times of 3MS. They will work as replacements for Shugart 800, 801, 850, 851. They require no AC to operate. **CEC,** 1745 Adrian Rd., Burlingame, CA 94010. 800-228-3411.

8" DSDD ½ height Shugart MOD SA 860-1 unused condition with full one year warranty. Price $279. These drives have track to track access times of 3MS. They will work as replacements for Shugart 800, 801, 850, 851. They require no AC to operate. **CEC,** 1745 Adrian Rd., Burlingame, CA 94010. 800-228-3411.

8" SSDD ½ height Shugart MOD SA 810-1 unused condition with full one year warranty. Price $269. These drives have track to track access times of 3MS. They will replace Shugart MOD 800, 801, or any other 8" SSDD drives, however they require no AC to operate. **C.E.C.,** 1745 Adrian Rd. Unit 1, Burlingame, CA 94010. 800-228-3411.

8" SSDD ½ height Shugart MOD SA 810-1 unused condition with full one year warranty. Price $269. These drives have track to track access times of 3MS. They will replace Shugart MOD 800, 801, or any other 8" SSDD drives, however they require no AC to operate. **C.E.C.,** 1745 Adrian Rd. Unit 1, Burlingame, CA 94010. 800-228-3411.

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8" SSSD Drives, $75. Can be used as double density. Removed from operational equipment. Shugart 8" 50 Hz, 220V conversion kits also available. **Digital Search,** 803-877-9444.

★ ★ ★

All used products over $100. Buy/sell through nationwide listing service. **NO CHARGE** for buying direct from owner. **NO RISK** for sellers - 6% commission when successful. Open 24 hours if you have a touchtone phone. **203-762-8677.**

COMP-USED

85 Rivergate Drive, Wilton, CT 06897. 3-76

Bargain Priced 8" Disk drives! QUME DT8 DSDD Drives; Aligned $125EA, need alignment $100EA, not working $75EA or 2/$125. Siemens FD100-8 SSDD drives: Aligned $50EA, need alignment $40EA, not working $25EA or 5/$100. Siemens FD200-8 DSDD drives: Aligned $100Ea, need alignment $75EA, not working $50EA or 3/$99. TEAC FD50B 5" SSDD used by Tandy & NEC new working $50EA, need work $25EA. Drives sold as aligned. Have warranty, others sold as-is. Call **714-820-1258,** or write **Michael Louie,** 1118 Lancewood Ave., Rialto, CA 92376. 3-75

CABINET for two 8 inch wide style Shugart drives. Fan, all AC and DC wiring with power supply, $100. **Cascade Electronics Inc.,** Route 1 Box 8, Randolph, MN 55065. 507-645-7997.

CM3426 WINCHESTER disk drive. 20.15 Mbytes formatted low power (same as minifloppy) half-height. ST-506 interface. One full year warranty $369. **Cascade Electronics Inc.,** Route 1 Box 8, Randolph, MN 55065. 507-645-7997.

DISK SERVICE MANUAL, DISK DRIVE TUTORIAL, PRINTER - PLOTTER MANUAL, COPIER MANUAL, COMPUTER PHREAKING, SUPER REINKING METHOD - More!! See enclosed display advertisement. Information ($1): **Consumertronics Co.,** Attn: Computers, 2011 Crescent, Alamogordo, NM 88310. 12-76

For Sale: 1 GDL Graphics Board A-1000 with 8088 processor S-100, 128K $500; 1 Zenith 13" RGB ZU136-long persistance Monitor, $450; 1 Qume 102-A Terminal $350; 2 Compu-Pro RAM 17 (64K) $250; 1 Compu-Pro Disk 2/channel select $400. **Cal Coastal,** 5 East Gabilan Street, Ste. 2318, Salinas, CA 93902. 2-76

IBM XT Full Height 10mb hard disk with CtLR. $390. **PCS/HDS,** Box 524, CML, CA 95009. 408-559-1568. 3-76

INNOVEX 200 8" SSSD DRIVES, excellent quality. Can be used double density. 4 for $100. Complete, but require alignment or adjustment. **Digital Search,** 803-877-9444.

MICRO-FLOPPY 3½" drives. 500k bytes Shugart SA300 w/warranty - $100 each. NEC FD1035, DSDD (1 meg) $175 each. Same interface as 5¼" drives. **Digital Search,** 803-877-9444.

SHUGART (100pcs) SA-200 5¼" TRS-80 compatible brand new original factory carton with OEM specification manual guaranteed $39.95 each. Shipped C.O.D. **Zytel,** 489 Johnson Ave., Bohemia, NY 11716. 516-567-6942. 3-76

SPECIAL SALE

MPI 52S 5¼" DS/DD full ht. $55 plus shipping. **LDL ELECTRONICS,** 13392 158 St. N., Jupiter, FL 33458. **305-747-7384.**

Shugart Disk drives for sale. All units are reconditioned, aligned, tested, and carry a 180 day warranty. SA801R 8" SSDD: new $175EA, Used $125EA, SA851R 8" DSDD used $225EA, SA400L 5" SSDD used $75EA. All units are late revs. I have a new and used drive enclosures available. Also have S-100 BRDS for sale see heading #130. Special pricing available with purchase of disk controller BRD. **Call 714-820-1258,** or write, **Michael Louie,** 1118 Lancewood Ave., Rialto, CA 92376. 3-75

TANDON DS/DD IBM ½ ht. drives. Brand new. $74 each. Dealer inquiries welcome! **408-971-9101.**

20 MEG WINCHESTER BY CMI
LOW POWER (Same as floppy)
HALF-HEIGHT ST-506 Interface
1 YEAR Full Warranty **$369.00**

Call For Z-80 (CPM) Controllers

CABINET with power supply for two Shugart wide drives **$100.00**
SA800-2 Disk Drive Guaranteed **$59.00**
SA850 Disk Drive Guaranteed **$99.00**
SA800 Repair, plus parts **$20.00**
SA850 Repair, plus parts **$30.00**
KEYBOARD by Microswitch 113 Keys, 8 Bit ASCII output with case **$40**

CASCADE ELECTRONICS
ROUTE 1 BOX 8
RANDOLPH, MN 55065
507-645-7997
COD Add $2

FREE SHIPPING
On Over $40.00
Credit Card Add 5% MN Add 6%

★ ★ ★

TANDY 1000 DRIVES

HIGH QUALITY 5¼" half height disk drives, DSDD 360K. Easy installation, instructions included. 100% compatible, 30 day guarantee, $124.95 ea. **TLC,** 415 W. Dale #3, Flagstaff, AZ 86001. 602-774-8940.

WANTED: 1541 Commodore Disk Drives $85, for those in working condition. Please call **800-221-7770.** 4-74.

WANTED: Commodore Computers CBM 8032 $150. CBM 8050 drive $150. Please call **1-800-221-7770.**

WINCHESTER CONTROLLER kit. Will control ST506 hard disk drives, $200. Faster than Western Digital WD1002 controllers. SA1002 8" hard disk controller also available. **Digital Search,** 803-877-9444.

WINCHESTER DRIVE Sale. Shugart SA1002. 8"-5 megabytes, 2 for $100, controller kit $200. **Digital Search,** 803-877-9444.

Wanted: FWD5000 disk controller made by Scientific Micro Systems. **Brent Watkins,** Box 80602, Fairbanks, AK 99708. **907-474-7479**

(174) PRINTERS

3 PRINTERS, excellent condition! DEC-PRINTER III LA120RA, 180CPS, Diablo 630 w/forms tractor, Dataproducts M-100L dot matrix. Buy one or all 3, call **216-321-0626.** 3-76

C-ITOH F10-40 w/Swiss bi-directional tractor, excellent condition, parallel interface, complete manuals, $600. **Christopher Dennen,** PO Box 1873, Fairfield, Iowa 52556. 515-472-4507.

C. ITOH, NEC owners-get Correspondence Quality print with our ROM installed. Our font replaces Proportional font. All other functions remain. If you have older C. Itoh or NEC 8510 or 1550 (with plastic bottom plate), send $30 + $5 S&H ($40 + $5 for newer style unit) for ROM and instructions, or SASE for sample of print qualities to: **Microtrend Computers,** 56 Ferris Street, Corning, NY 14830. **607-936-3053.** Allow 3 weeks for delivery, If ordering, please specify old or new style. Money back if not satisfied.

CUSTOM WORDSTAR Instructions for Epson, Star/Gemini, Canon Panasonic, Citizen, BMC, Legend, Olympia, Okidata, Prowriter printers; get boldface, continuous underlining, super/subscripts, compressed, enlarged characters and more. $10, specify computer and Wordstar version. **LAI,** PO Box 13118, Minneapolis, MN 55414. 3-76

CUT SHEET Feeder, like new Model 7850, fits IBM 5219 printer, IBM retail, $1850. Asking $1000. Call Dallas, Texas **214-289-2901, 8AM-5PM.**

Comrex Crite Only $339!!! List $599!! 18 CPS Daisywheel Parallel. Sheet feeder only $139! Both new in factory carton. Add 3% shipping. **606-255-2298, Datalex,** 1389 Alexandria #1, Lexington, KY 40504. 2-77.

Corona Laser printer LP300. Same resolution and speed as H.P. Laserjet, but comes with 13 fonts of all sizes on disk. Prints to 300 D.P.I., has Epson graphics mode. Absolutely like new & must sell! Includes IBM interface card. Best offer near $1995. **R.C. Owens, 214-826-0347.**

DIABLO 630 letter qlty. printers, Like new, perfect condition, from $875. 630 API (serial & parallel) $1160. 630 KSR (with keyboard) $1395. Diablo 1650 KSR, metal wheel, 45 CPS $925. model 620, 21 CPS, $475. Full warranty. Superior equipment at excellent prices! **Expansion Products Service Company,** (Certified DIABLO Service Center), contact us for full details & pricing, PO Box 4217, Mountain View, CA 94040. 415-965-7222.

DIABLO HYTYPE I, serial interface, power supply in cabinet stand, manual, $150. Can't ship, pickup in Kansas City area. **Ron, 816-758-6657** days, 758-6236 evenings.3-76

DIABLO P-11 dot matrix printer, (list $649) unused $200 each. Full warranty. 100 CPS parallel interface, excellent quality. **Digital Search,** 803-877-9444.

DIABLO PRINTER accessories: Forms tractors for 630 & Hytype II printers; Uni-Directional $95; Bi-Directional $195 (new), $165 (used); sheet feeder, mechanical, $425 (new), $350 (used). Dual bin sheet feeder, automatic, processor controlled, for Diablo 630: $975. **Expansion Products Service Company,** PO Box 4217, Mountain View, CA 94040. 415-965-7222.

DIABLO PRINTER Model 1610 Daisywheel Letter Quality, 48 CPS, like new, $495. **Expansion Products Service Company,** PO Box 4217, Mountain View, CA 94040. 415-965-7222.

DIABLO or Qume printer **power supply kit.** $75. New Qume pin feet platens $40. **Digital Search,** 803-877-9444.

For Sale: 1 GDL Graphics Board A-1000 with 8088 processor S-100, 128K $500; 1 Zenith 13" RGB ZU136-long persistance Monitor, $450; 1 Qume 102-A Terminal $350; 2 Compu-Pro RAM 17 (64K) $250; 1 Compu-Pro Disk 2/channel select $400. **Cal Coastal,** 5 East Gabilan Street, Ste. 2318, Salinas, CA 93902. 2-76

GREAT BARGAINS! Tandy FP-215 color printer plotter - list $1000, only $250. Also, Tandy CGP-215 color printer, list $200, only $125. Call Mike at **904-372-2086.**

Houston Instruments DMP-40-Z plotter. RSX232 interface, $560. DMP-29 plotter, RSX232 interface, $1200. **714-627-7411 Ken.** 2-75

IBM 15" Selectric Printer/Typewriters, standard ASCII code, serial/parallel. All units rebuilt, $369. **Ron's Electronics,** N5009 Sunset Vista, Onalaska, Wis. 54650.

INTERFACE KIT for Diablo or Qume printers RS232 or parallel, $95. Parts for Qume and Diablo HyType I: Repairs, cases, power supplies. **Digital Search,** 803-877-9444.

JUKI 6100: Daisywheel printers if your printer is defective and Juki Industries or their distributor has declined to honor it's warranty to you. Please write to me regarding all the particulars write to: **DWP/6100,** POB 613, Pocono Pines, PA 18350-0613.

KEYBOARD $89.95; Sheet-Feeder $99.95 for Brother15/Comriter/Dynax15 printers. $5 shipping. VISA/MC add 4%. **Kyntek Marketing,** Po Box 13070, Minneapolis, MN 55414. **612-379-1020.** 3-76

LETTER QUALITY, Daisy Wheel, wide carriage, friction & tractor, RS232C, Teletex TTX-1014, like new, $350. Centronics 152 Dot Matrix. 150 CPS, wide carriage, friction & tractor, compressed and expanded modes, buffer, RS232C, perfect, $275. 80 Column dot matrix, 120 CPS, expand and compress, tractor, RS232C & Centronics interfaces. Base 2, model 800, $90. **Russ, 408-251-7070.** 3-75

80% OFF

40 CPS Letter Quality Printer Liquidation $349

Wide carriage, 40 CPS daisy-wheel letter quality printer. Made by **C. Itoh.** For complete list of features and specifications, **see ad index** for full page display ad and other BCE bargains. **BCE 1-800-545-7447 24 hrs.**

For an offer you can't refuse ...
GODFATHER'S used computer SYNDICATE

$$$$ I Buy, Sell & Trade printers. **Godfather's Used Computer Syndicate,** PO Box 3037, 1154 W. SR 436, Forest City, FL 32714. **305-774-1111.** 3-76

70% OFF

NEC NLQ Printer Liquidation $149
Lowest Price Anywhere!

NEC PR103A 110 CPS parallel Dot Matrix Printer. High speed NLQ mode. Compatible with NEC 8023A (same as Apple Graphics Printer and C. Itoh Proprinter). Centronics interface, full warranty. Add $15 per printer shipping. See ad index for full page display ad with complete specifications. **BCE 1-800-545-7447 24 hours.**

70% OFF

Printer Liquidation Canon Color Ink Jet Printer (same as IBM ColorJet Printer)
$199

Canon PJ 1080A Ink Jet printer-37 cps, 640 dots per line, 7 striking colors, can be used for overhead projections. For more information, see ad index for **BCE** full color display ad.

For an offer you can't refuse ...
GODFATHER'S used computer SYNDICATE

$$$$ Toshiba 1350 for $899 like new. NEC SpinWriter #5510 with tractor, ribbon & thimble never installed, like new $1499. **Godfather's Used Computer Syndicate,** PO Box 3037, 1154 W. SR 436, Forest City, FL 32714. **305-774-1111.** 3-76

MALIBU 165 with Apple interface. 165 CPS. With an extra for parts! Works great, $250. **619-942-1619.**

★ ★ ★

NEC 5510 Excellent condition in original factory carton. 90 day warranty, $1000 or offer. **Compu-Cure,** 504-522-3691.

NEC 8023, 100 CPS, Dot Matrix, 80 column. Phone **216-844-8995** 8am-5pm. **Thomas Reidy,** 2105 Adelbert Rd., Cleveland, OH 44106.

OKIDATA 80 CPS, 7x9 Dot Matrix, friction feed, 10 characters per inch, 6 or 8 lines per inch, built in self test, new ribbon, 60 day guarantee, removed from service, parallel interface $99. Tractor feed free with printer. **Cascade Electronics,** Route 1 Box 8, Randolph, MN 55065. 507-645-7997.

Okidata ML83A printer. Excellent Condition $300. **Paragon Computer Corporation 203-525-0389.** 3-76

Okidata ML83A. Excellent condition. $350 firm. **Paragon Computer Corporation, 203-525-0389.** 2-75

TRACTOR FEED for Microline 80 or Microline 82. New in box $35. **Cascade Electronics,** Route 1 Box 8, Randolph, MN 55065. 507-645-7997.

TTX1014 Cut sheet feeders, $69.95. Fits Swintec, Nakajima Olympia Electronic R.O. **415-829-4976.** 3-83

TYPEWRITER/PRINTER $75. Taken off line. Similar to ones offered in CPU's ad. These make great letter quality typewriter/printers. We supply detailed instructions and have a complete interface (with serial and parallel) for $105. **Ron's Electronics,** N5009 Sunset Vista, Onalaska, Wis. 54650. 608-783-5341.

USED NEC Spinwriter #5510 with tractor, excellent condition, NEC service report available. $1000. **212-432-1960** Call 9-4 daily.

WANTED: EPSON, Prowriter Dot Matrix printers. Please describe types, conditions, extras (manuals, buffers, tractor feeds, stands, etc.) prices. **Williams,** 2011 Crescent, Alamorgordo, NM 88310. 12-76

WANTED IBM Selectric 50 or 60 printer with TRS-80 III interface. **408-335-3209.** 3-77

WANTED: OKIDATA SL125 or SL160 printers, broken or working, we pay shipping. **614-436-8080.** 11-76

Xerox 800 Letter Quality Printer, 33 cps, special print features included..Original value $1,500..will sell $700 or best offer. Includes 5 print wheels and 6 ribbons. **Call Chris 203-464-6450** for more specific details.

(178) TAPE DRIVES

APPLE 9-TRACK TAPE DRIVES — Read/ write standard ½-inch, 800 BPI, IBM compatible tapes on an Apple. Exchange data with minis and mainframes. Backup floppies and hard disks. $1000-$2100. **Electrovalue,** Box 376-C, Morris Plains, NJ 07950. 201-267-1117. 8-78

IBM-PC 9-TRACK TAPE DRIVES

Electrovalve Industrial, a pioneer in providing industry standard 800 BPI 9-track tape drives for the Apple (see article, April Computer Shopper, p. 46) now has a product for the IBM-PC. Exchange data with minis and mainframes. $1000-$2100. Call for brochure. **Electrovalue Industrial Inc.,** Box 376-CP, Morris Plains, NJ 07950. 201-267-1117. 7-77

INTELLIGENT HARD disk streaming tape controller Sysgen SC4000, $150. **Bob Rossi,** PO Box 26798, Rochester, NY 14626. 716-225-6754.

½" MAG tape drives. New and used. Wanco 7" & 10" from $150 to $450 ea. **Digital Search** 803-877-9444.

SYSGEN QIC-FILE 20 Meg. Byte tape for IBM PC and IBM XT. Original packing with Six DC600A cartridges, **201-560-0751.** Easy Street Computer Systems, PO Box 149, Bound Brook, NJ 08805-0149.

(180) CRTS, MONITORS

12" GREEN screen monitors, never used, distributors surplus, orig. $89. Pay only $39 plus shipping. **Rivendell, 603-783-4708.**3-75

LEAR SIEGLER ADM CRT, Excellent condition! Best offer, call **216-321-0626.** 3-76

For an offer you can't refuse . . .
GODFATHER'S used computer SYNDICATE

$$$$ Super Hi-Res RGB Toshiba monitors, manufactured for IDS with swivel/tilt stand and cable for $320 delivered. Pitch .31' - .39', 500-700 dots horizontal - 400 vertical dots with Hi-Res board, 8 colors. **Godfather's Used Computer Syndicate,** PO Box 3037, 1154 W. SR 436, Forest City, FL 32714. **305-774-1111.** 3-76

(181) CRT TERMINALS

(182) TERMINALS

ADDS VIEWPOINT ERGO with original 90-day warranty, $375. **Digital Search,** 803-877-9444.

BEEHIVE DM5A Terminal and manual, detached keyboard, graphic symbols, programmable keys, $195. CA **415-499-8101.**

Beehive CRT's and parts for sale, rent or lease. Repair exchanges also Cado beehives and cromemco 3102's. Superbee II's, B100, B300/400, B500/550, Microbee, DMIS DM20/30, DM83, DM3270, DM standards, ATL083, ATL3270, ATL004, and more. Call **Mark (916) 677-0355** 10-78

HENDRICKSON TELEX-VIR 1000-Multi port video terminal allows sending and receiving of messages concurrently with message preparation. Delayed dialing, dial directory, auto-log. New in 84. Need $995. **Gilda, 813-597-1102.** 10am-to 4pm

For an offer you can't refuse . . .
GODFATHER'S used computer SYNDICATE

$$$$ Super Televideo 950 Terminals like new $299!! With 90 day warranty!! **Godfather's Used Computer Syndicate,** PO Box 3037, 1154 W. 436, Forest City, FL 32714. **305-774-1111.** 3-76

80% OFF

Terminal Liquidation

Televideo 925's
$179

Reconditioned, 30 day guarantee. Call **BCE, 202-944-3900.** See ad index for other BCE bargains!

LSI ADM-11 TERMINAL, barely used, documentation included, $300 (firm). Call David, 201-387-6948.

Microterm ACT-IV full feature smart terminal with RS232, numeric keypad, etc. $200. **DEC LA36** printing terminal wih Accelwriter 600 Baud, RS232 $400. Both F.O.B., with documentation and almost virgin condition. **Barry Jones,** 23 Vesta, Fredericksburg, VA 22405. **703-371-3616.**

New NCR 7930 $824; Wyse 50 $490; Wyse 75 $630; Altos-II $790; Altos-III $630; Altos-IV $395. FC, CCR. **Call 813-442-9967.** 3-75

TELEVIDEO 925 Terminals. Excellent Condition. $320. **Paragon Computer Corporation, 203-525-0389.** 2-75

TI SILENT 700 printing terminal with modem, $350. DataComm commercial quality 1200b modem with phone & self-test, $200. **Dave 612-379-1170.**

Televideo 925 Terminals. Excellent Condition $400 firm. **Paragon Computer Corporation, 203-525-0389.** 3-76

Visual 500; graphics, Alphanumeric Terminal nine operating modes smart editing four interface options, Manuals, original, box. $600. **B/O 603-774-3453 eves.**

WYSE 30, New $395. Adds Regent 25 $125. Lear ADM 21 $250. **Russ, 408-251-7070.**3-75

(183) MULTIBUS BOARDS

Interlan NI3010 Multibus Ethernet Board, New (list $1390) sell $950. **203-755-1180.**2-75

(184) MEMORY

(186) MODEMS

1200-BAUD Western Electric modem module provides direct connect to phone line. Two for $100, with schematic. This is an excellent value for the technically-oriented hobbyist who wants high-speed modem communications. **Digital Search,** 803-877-9444.

ANDERSON JACOBSON, AJ1259, excellent condition! Best offer, call **216-321-0626.**3-76

FREE! SHOP by Modem! Call our innovative electronic shopping center, **Fantasy Plaza,** by Modem (818)840-8066. 11-79.

GENERAL DATACOMM 2400ASM (2400 baud) modems. Two in perfect condition, $1000 or best offer. **Mort at 305-866-8631.** 3-75

68% OFF

1200 BPS Modem Liquidation
$189

USRobotics Password 1200/300 bps Modem. Autodial/Answer. Works with PC-Talk, Crosstalk and most other communications software. Works with IBM, Apple, Kaypro, etc. RS232-C male/female interface. Compact design. Add $5 per modem shipping. **BCE 1-800-545-7447** 24 hours. See ad index for other BCE bargains.

MODEM owners! The PRICE BUSTER is for you! PRINTED classifieds, articles, programs, messages, and more..Infor online, **818-709-4095.**

Modems 2400 BD syntech 201, 208, ICC, 2200/24 $89 ea + $10 shpg. Manual Free with set. **301-997-5700 evenings.**

RACAL-VADIC 1200/300 Maxwell. List $295. Sell for $195 FC. **Gary 205-988-4336.**

(187) WORD PROCESSING

(188) MISC. EQUIPMENT

3M DC300 XL Data Tape Cartridges (new) $10 each. **203-755-1180.** 2-75

AMTEXT 425 WORD PROCESSING SYSTEM. Complete "L" shaped work station consisting of keyboard, CRT, printer, 8" dual side-by-side disk drives (drives occupy the right-side pedestal), and 3-drawer file (files occupy the left-side pedestal). operating Reference manual and Telecom Option board and cable included. Professionally serviced, recently PM'. Excellent operating condition. Price: $2500 includes delivery and installation within 200 miles of Harrisburg, PA. Contact **Chris Lidle,** CSI 717-944-4870.

★ ★ ★

Cables serial RS-232 cables, 1' to 50', excellent condition $4 to $12. **415-388-0838.**

Computer Products Corp. Rimfire 44 Multibut Tape and Disk Controller board, New (list $2995) sell $1500. **203-755-1180.** 2-75

Computer cables Y-power $1.25; comdac $1.15; HD-cable $4.00; 3½ Power $1.00; tape-B/U cable $6.37' 100 pcs ea. Minimum buy. **N. Sepulveda,** 9608 Maureen Dr. A-2, Garden Grove, CA 92641.

DATA I/O PROM programmer with UniPak, $1500. Remex high speed paper tape recorder/punch, $500. Biomation logic analyzer, $500. Call **Ralph, 714-891-2363.**2-75

DEAD PARTS WANTED
LIVE PARTS FOR SALE

ERM buys and sells electronic material. We pay immediate cash for printed circuit boards, IC's, relays, contacts, transistors, connectors, switches, keyboards, card cages, LED's, and computers ... DEAD OR ALIVE. Call **"Digger" at 617-662-9363.**

DESIRE TO make contact with programmer for MS-DOS/CPM for mutual development of marketing software. Write **Dr. D.E. Painter,** 2453 Wilmont Ave., Jacksonville, FL 32218.

★ ★ ★

UHF TV Decoder for Sinewave over the air subscription TV. Model Beta 2. Completely assembled and tuned with a lot of related documentation $100 OBO. **215-782-1452, evenings.** 2-75

Get Rich with Your Microcomputer, 100 home income opportunities, secrets revealed. **Owens,** Box 5805-A, Scottsdale, AZ 85261.

I WANT to purchase a Commodore 64 with accessories. **Stewart Minor,** PO Box 35243, Los Angeles, CA 90035.

JUNIOR MANAGER Business simulation program with graphics. Ages 9-up. Satisfaction guaranteed, $19.95. **Computer Alternatives,** 4025 Laguna, Palo Alto, CA 94306.

KEYBOARDS. Microswitch. 74-key, Hall-effect, high quality. Parallel ASCII. New-$45. Used-$25. **Digital Search,** 803-877-9444.

Motorola M68K Development System New PC Boards: VME4000 interface (list $395) sell $200. VM03 68010 processor Board (list $3995) sell $2500. VM11 RAM Board, ½ MB (list $2700) sell $1500. **203-755-1180.** 2-75

NEC MODEL APCH03, color graphics monitor, 128K RAM, dual megabyte drives, Sweat-P plotter, bit-pad, 35mm Celtic camera, bundled graphics software. Phone: **216-844-8995** 8am-5pm. **Thomas Reidy,** 2105 Adelbert Rd., Cleveland, OH 44160.

NON-LINEAR SYSTEMS MS-15 Miniscope miniature portable 15-Mhz oscilloscope. Triggered sweep, rechargeable battery, with x10 probe. List $466, first $300 takes it. Call **Paul Pennington,** 404-863-7285 or 863-1254.

Protect your disks with beautiful solid oak storage boxes. Holds 100-5" $15 postpaid. Con US. Send color photo . **Ed Vinson,** 2406-S University, Spokane, WA 99206.

(189) BOOKS, MAGAZINES

★ ★ ★

Book Sale! Send for large list of computer and electronic books. **Bruce Sugarberg,** 1415B DeWitt Drive, Akron, OH 44313.3-76

COMPUTER USERS join the REAL computer revolution! With "Hooking In: The Underground Computer Bulletin Board Workbook and Guide." Your key to FREE: software, inside info, computer dating, shopping, electronic mail, x-rated dialogs, fun, games. Includes 1000+ current phone numbers to call with your computer. Only $9.95. Free Information. **Computerfood,** Box 608C, Oracle, AZ 85623. 3-76

DISK SERVICE MANUAL, DISK DRIVE TUTORIAL, PRINTER - PLOTTER MANUAL, COPIER MANUAL, COMPUTER PHREAKING, SUPER REINKING METHOD - More!! See enclosed display advertisement. Information ($1): **Consumertronics Co.,** Attn: Computers, 2011 Crescent, Alamogordo, NM 88310. 12-76

DOZENS OF Computer and Electronics books in Excellent condition for wide range of interests at bargain prices. Send SASE to **D. Schiller,** POB 1339, Culver City, CA 90232. 3-76

FOREIGN COMPUTER MAGS. Large list of addresses of publishers. Around 100 titles from all over the world. Send $3 to: **F. Engelberts,** Box 1422, 2970 Emden/W. Germany. 3-76

★ ★

TROJAN HORSES, LOGIC BOMBS AND WORMS. Hackers notebook series presents **(The Programming Logic of Trojan Horses, Logic Bombs, and Worms). Easy enough for beginners yet detailed enough for the more inquisitive person. $15 $2 postage & handling. Make checks or M/O payable to: CYB,** Dept. Wizonics, PO Box 245, Willingboro, NJ 08046. Personal checks require two week clearance.

Tab Books ½ price most titles stocked. Robot books specialty. Postpaid with check. Refund if not in stock. **Interface,** Box 3040, Laurel, MD 20708. 2-75

(190) MISC. LARGE SYSTEMS

★ ★ ★

All used products over $100. Buy/sell through nationwide listing service. **NO CHARGE** for buying direct from owner. **NO RISK** for sellers - 6% commission when successful. Open 24 hours if you have a touchtone phone. **203-762-8677.**

COMP-USED

85 Rivergate Drive, Wilton, CT 06897. 3-76

CONTROL DATA 9448 cartridge model drive 16MB fixed, 16MB removeable. In original crate. Never set up. W/Extras, $2000. Call **Dave 301-398-7340.** 3-75

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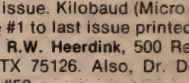
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(Please add $1 shipping and handling for each title ordered from below.)

	Wholesale
Arrays *Home Accountant-Mac Only*	$65.00*
Axlon *Art Portfolio & Card Shoppe*	31.00*
Bluechip *Baron/Millionaire/Tycoon*	26.00*
Broderbund *Loadrunner*	19.75*
Broderbund *Choplifter*	19.00*
Broderbund *Print Shop*	28.75*
Broderbund *Dazzle Draw*	31.97*
CBS *Mastering the GRE*	53.50*
CBS *Murder by the Dozen*	20.97*
CBS *Goren Bridge Made Easy*	45.00*
Counterpoint *The News Room*	26.97*
Davidson *Speed Reader II*	36.50*
Davidson *Math Blaster*	26.50*
Davidson *Word Attack!*	26.50*
1st Byte *Smooth Talker-Mac Only*	47.00*
Hayden *DaVinci-House/Interiors/Landscapes*	24.75*
Hayden *Sargon III*	25.75*
Infocom *Deadline or Suspended*	24.00*
Infocom *Enchanter, Planetfall Cutthroats, Witness or Zork I*	20.00*
Infocom *Hitchiker's Guide or Seastalker*	20.00*
Infocom *Suspect, Sorcerer or Infidel*	22.00*
Infocom *Zork II or III*	22.00*
Layered *Front Desk-Mac Only*	65.00*
Mirage Concepts *Trivia*	11.00*
Miles Computing *Mac Attack-Mac Only*	$23.00*
Palatir *Mac Type-Mac Only*	23.50*
Penguin *Graphics Magician*	28.97*
Penguin *Pensate or Xyphus*	20.00*
Penguin *Transylvania-Mac Only*	20.00*
Professional Software *Trivia Fever*	19.00*
Pryority Software *Forbidden Quest*	21.00*
Scarborough *Master Type*	26.50*
Scarborough *Run for the Money*	26.00*
Simon & Schuster *Typing Tutor III*	28.25*
Sir-Tech *Wizardry*	26.97*
Sir-Tech *Knight of Diamonds*	18.97*
Sir-Tech *Rescue Raiders*	18.97*
Sublogic *Night Mission Pinball*	20.00*
▶**Spinnaker** *Alphabet Zoo, Face Maker, Kinder Comp, Hey Diddle Diddle, Rhymes & Riddles, Story Machine*	15.97*
▶**Spinnaker** *The Most Amazing Thing*	20.77*
▶**Spinnaker** *Delta Drawing*	24.97*
T/Maker *Click Art-Mac Only*	25.00*
Warner *Desk Organizer*	65.00*
Videx *Fun Pack-Mac Only*	19.77*
Videx *Mac Checkers & Reversal*	25.17*
Videx *Mac Vegas-Mac Only*	31.00*
Virtual Combinatics *Micro Cookbook*	21.00*

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▶**Apple** *Apple Works*	$160.00*
Boriand International *Turbo Pascal*	30.00*
BPI *GL, AP, AR, PR, or INV*	205.00*
Broderbund *Bank Street Writer*	40.00*
Central Point *Copy II Plus or Copy II Mac*	20.00*
Funk Software *Sideways*	32.00*
Funsoft *Macasm*	60.00*
Haba *Habadex*	40.00*
Haba *Quartet*	97.00*
Harvard *Mac Manager*	29.95*
▶**Human Edge** *Mind Prober*	24.00*
▶**Human Edge** *Sales Edge*	110.00*
Human Edge *Communication Edge*	98.00*
▶**Living Videotext** *ThinkTank-Mac Tool*	85.00*
Main Street *Filer-Mac Only*	67.00*
MECA *Managing your Money*	87.50*
▶**Microsoft** *Word for Macintosh*	$102.00*
▶**Microsoft** *File for Macintosh*	102.00*
▶**Microsoft** *Multiplan for Macintosh*	102.00*
Microsoft *Basic for Macintosh*	79.00*
Microsoft *Chart for Macintosh*	66.00*
Monogram *Dollars & Sense for Apple II*	55.00*
Monogram *Dollars & Sense for Macintosh*	70.00*
Odesta *Helix for Macintosh Reg's 512K*	200.00*
Provue *Overvue-Mac Only*	135.00*
Sensible Software *Sensible Speller IV*	67.50*
Softcraft *Fancy Fonts*	125.00*
Softech Microsystems *UCSD Pascal*	37.00*
Software Arts *TK Solver! for Mac*	134.00*
Software Publishing *PFS: File, Write, or Graph*	68.00*
Stoneware *DB Master-Mac Tool*	95.00*
Telos *Filevision for Mac*	87.50*

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(Please add shipping and handling charges found in italics next to price.)

DISK DRIVES

	Wholesale	
Alps *AP-100A Dual Apple Drives in One Case*	$309.00*	*(7.00)*
▶**Alps** *AP-100C Slimline Drive in Case*	159.00*	*(4.00)*
Apple *MAC 400KB External Drive*	349.95*	*(7.50)*
IOmega *Macnoulli 5MG Removable Drive for Machintosh*	1,250.00*	*(27.00)*
Micro Sci *A2 143KB Drive Just like Apple's Own*	150.00*	*(5.00)*
Micro Sci *Floppy Controller*	55.00*	*(2.50)*
▶**Paradise** *Mac 10MB Hard Drive Subsystem*	750.00*	*(16.20)*
▶**Paradise** *Mac 20MB Hard Drive Subsystem*	950.00*	*(20.52)*
▶**PC Network** *140K External Drive for Apple IIc*	95.00*	*(2.50)*
Rana *Elite I 163K Drive*	225.00*	*(5.00)*
Tecmar *5MB Removable Drive for MAC*	999.00*	*(21.58)*
Tecmar *10MB MAC Drive*	999.00*	*(21.58)*
Tecmar *5MB MAC Drive Upgrade*	1,235.00*	*(26.68)*

BOARDS AND BUFFERS

ALS *Z-Engine*	$115.00*	*(2.50)*
AST™ *Multi I/O—2 serial/Clock*	155.00*	*(2.50)*
Microsoft *Premium Softcard IIe*	243.67*	*(2.50)*
Microtek *Dumpling/GX*	55.00*	*(2.50)*
Orange Micro *Grappler +*	66.00*	*(2.50)*
Orange Micro *Serial Grappler*	66.00*	*(2.50)*
PC Network *Z80 Card*	35.00*	*(2.50)*
Quadram *APIC/G Graphics Interface*	62.00*	*(2.50)*
Quadram *e RAM-80*	88.00*	*(2.50)*
Quadram *Multicore—1 Parallel/1 Serial/ Clock Expandable to 256K*	140.00*	*(2.50)*
Thunderware *Thunderclock*	104.00*	*(2.50)*

MODEMS

Hayes *Micromodem IIe w/Smartcom*	$125.00*	*(2.50)*
Novation *Apple Cat II*	174.45*	*(3.50)*
Prometheus *1200 A Low Cost 1200 Baud Internal Modem for Apple II.*	276.00*	*(6.00)*
Prometheus *Promodem 1200 w/Mac Pack*	299.00*	*(6.00)*
Prentice *Pop Com MAC Pack 1200 Baud Modem, Cable, Straightalk*	245.00*	*(2.50)*

ACCESSORIES

Apple *Macintosh Carrying Case*	$69.00*	*(1.49)*
Apple *Macintosh Security Kit*	29.00*	*(1.50)*
Apple *Macintosh Numeric Keypad*	69.00*	*(2.50)*
Hayes *Mach III Joystick w/Fire Button for IIe*	31.00*	*(1.50)*
Kensington *Disk Case*	20.00*	*(1.50)*
Kensington *Dust Cover for MAC or imagewriter*	8.25*	*(1.50)*
Kensington *Starter Pack*	54.00*	*(3.00)*
Kensington *Surge Protector*	33.47*	*(2.50)*
Kensington *Swivel*	21.00*	*(2.50)*
Kensington *System Saver Fan*	56.97*	*(1.50)*
▶**Koala** *MacVision*	158.00*	*(3.00)*
Koala *Koalapad Touch Tablet*	78.00*	*(1.50)*
M&R *Sup-R-Mod RF Modulation*	44.00*	*(1.50)*
PC Network *Cooling Fan with Surge Protector & Dual Outlets*	25.00*	*(2.50)*
PC Network *SSDD Diskettes (Box of 10)*	7.95*	*(1.00)*
PC Network *Macintosh Diskettes Includes Free Flip & File Case*	15.95*	*(1.50)*
These Diskettes are Guaranteed for Life! No Generics!		
Sony *MAC Diskettes (Box of 10)*	19.00*	*(1.50)*

GAMES & EDUCATIONAL SOFTWARE FOR YOUR IBM

(Please add $1 shipping and handling for each title ordered from below.)

	Wholesale
ATI *Intro to PC DOS Vol. I & II*	$23.00*
ATI *Intro. to BASIC*	23.00*
Bluebush *Chess (Your Toughest Opponent)*	34.00*
Bluechip *Millionaire/Oil Baron or Tycoon*	26.00*
Broderbund *Lode Runner*	19.75*
CBS *Goren-Bridge Made Easy*	40.00*
CBS *Mastering the SAT*	50.00*
CDEX *Training for Word Star*	37.25*
Comprehensive *Intro to Personal Computing*	32.00*
Davidson *Math Blaster, Word Attack!*	26.50*
Davidson *Speed Reader II*	36.50*
Hayden *Sargon III*	25.75*
Individual *Professor DOS*	32.50*
Individual *The Instructor*	24.50*
▶**Infocom** *Zork I or Witness*	20.00*
▶**Infocom** *Deadline, or Suspended*	$24.00*
Microsoft *Flight Simulator*	27.00*
Mouse Systems *PC Paint—Turn your PC into A Color Macintosh!*	59.95*
Scarborough *Mastertype*	26.50*
Sierra On-Line *Crossfire*	18.00*
Sierra On-Line *King's Quest II*	27.00*
Spectrum Holobyte *GATO*	18.00*
▶**Spinnaker** *Alphabet Zoo, Kinder Comp, Story Machine, Face Maker, Hey Diddle, Diddle, rhymes & Riddles*	15.97*
▶**Spinnaker** *Delta Drawing*	24.97*
▶**Spinnaker** *Most Amazing Thing*	20.77*
Sublogic *Night Mission Pinball*	20.00*
Virtual Combinatics *Micro Cookbook*	21.00*

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(Please add $2.50 shipping and handling for each title ordered from below.)

▶**Ashton-Tate** *DBase III*	$395.00*
▶**Ashton-Tate** *Framework II*	395.00*
Borland *Turbo Pascal*	25.75*
Borland *Side Kick (Protected)*	26.00*
Borland *Turbo Pascal 8087*	49.75*
Borland *Superkey*	32.00*
BPI *G/L, A/R or A/P*	305.00*
BPI *Aura*	265.00*
BPI *Personal Accounting*	48.00*
Breakthrough *Timeline*	230.00*
▶**Central Point** *Copy II PC*	20.00*
Conceptual Instruments *Desk Organizer*	157.00*
Digital Research *DR Logo*	75.00*
Digital Research *Gem Desktop*	25.00*
Digital Research *Gem Draw*	73.00*
Enertronics *Energraphics*	155.00*
Funk Software *Sideways*	32.50*
▶**Harvard** *Harvard Project Manager*	175.00*
Harvard *Total Project Manager*	225.00*
▶**Hayes** *Smartcom II—New VT100 Emulator*	84.00*
▶**Human Edge** *The Manager's Edge*	137.00*
▶**Human Edge** *Mind Prober*	24.00*
Infocom *Cornerstone*	242.00*
Lifetree *Volkswriter III*	135.00*
▶**Lotus Development** *Lotus 1-2-3*	285.00*
MDBS *Knowledgeman/2*	295.00*
MicroPro *Wordstar 2000*	$219.00*
Micro Pro *Wordstar 2000+*	262.00*
MicroRim *Clout*	110.00*
MicroRim *RBase 5000*	300.00*
Microsoft *C Compiler*	220.00*
Microsoft *Word—Latest Version 2.0*	202.00*
Microsoft *Multiplan*	101.00*
Microsoft *Mouse*	107.00*
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Multimate *Multimate (Latest Version)*	190.00*
Norton *Norton Utilities 3.0*	46.00*
Open Systems *P/O Sales A/R INV G/L A/P Team Mgr.*	ea. 275.00*
Power Base *Power Base*	197.00*
Real World *G/L A/P A/R or OE/INV*	ea. 275.00*
Rosesoft *Prokey Version 3*	65.00*
Ryan McFarland *RM COBOL (Dev. System)*	520.00*
▶**Samna** *Samna III Word Processor*	227.00*
▶**Samna** *Word +*	320.00*
▶**Satelite Software** *Word Perfect*	190.00*
Softcraft *Fancy Fonts*	125.00*
Meca *Managing Your Money*	87.50*
Software Publishing *PFS: File, Write, Graph*	68.00*
Software Publishing *PFS: Report*	64.00*
Sorcim *Supercalc III*	169.00*
Xanaro *Ability*	247.50*

HARDWARE FOR YOUR IBM

(Please add shipping and handling charges found in italics next to price.)

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IOmega *Bernoulli Box Dual 10MG Drives*	$2,149.00*	*(46.42)*
PC Network *AT 42MG Internal Hard Disk 35MS Access Time—Comes Complete*	1,155.00*	
PC Network *20MG Tape Backup Half Height Internal w/Controller*	495.00*	
▶**PC Network** *10MB INTERNAL Height Autoboot Drive: New lower price Drives by Shugart or Tandon*	330.00*	*(7.13)*
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▶**PC Network** *Half Height DS/DD Drives*	59.00*	*(1.27)*
▶**Tandon** *TM 100-2 Full Height DS/DD Drives*	93.00*	*(2.20)*
Tallgrass *25MB External/Hard Disk with 60MB Tape Backup*	2,250.00*	*(48.60)*

MULTIFUNCTION CARDS

Apparat *AT Ram Expansion Card*	$139.00*	*(2.50)*
▶**AST™** *SixPakPlus™ With 64K*	195.00*	*(2.50)*
AST™ *I/O Plus II™*	120.00*	*(2.50)*
AST™ *Advantage for AT™*	355.00*	*(2.50)*
▶**PC Network** *512K Memory Board w/0K*	59.00*	*(2.50)*
▶**PC Network** *The Multi-384 Board A clone of the AST's™ SixPakPlus™ Includes up to 384Kb of expansion memory, 1 serial, 1 parallel, 1 game port, a clock/calendar and software standard.*	79.00*	*(1.70)*
PC Network *I/O Plus II Clone Ser/Par/Game/Clock standard*	65.00*	*(2.50)*
Quadram *Improved Quadboard w/0K*	170.00*	*(2.50)*
Tecmar *Captain Multifunction Card w/0K*	146.00*	*(2.50)*

MODEMS

Everex *Evercom II 1200BPS Short Slot Modem. Lowest Cost Hayes Compatible Modem!*	$120.00*	*(2.50)*
Hayes *Smartmodem 1200B with New Smartcom II/VT100 Emulator*	312.00*	*(2.50)*
Hayes *Smartmodem 1200B Alone*	265.00*	*(2.50)*
Prometheus *Promodem 1200B Internal*	225.00*	*(2.50)*
Quadram *Quadmodem II 1200 Baud Hall Card w/Crosstalk XVI*	275.00*	*(2.50)*

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Hercules *Color Card w/Parallel Port*	$142.00*	*(2.50)*
▶**Hercules** *Monochrome Graphics Card*	263.00*	*(2.50)*
Paradise *Modular Graphics Card*	235.00*	*(2.50)*
▶**PC Network** *Hercules Mono Card Clone 100% Hercules Compatible!*	99.00*	*(2.50)*
▶**PC Network** *Color Card*	69.00*	*(2.50)*
Persyst *Bob Card Ultra High Res Color*	299.00*	*(2.50)*
▶**STB** *Graphix Plus II (simultaneous Mono Graphics & Color)*	199.00*	*(2.50)*

ACCESSORIES

▶**Brand Name DS/DD Diskettes Guaranteed for Life! Not Generic!**	$8.95*	*(1.00)*
▶**DS/DD Bulk Rate Special Packaged in 50 with sleeves and labels Guaranteed for Life!**	.59* ea.	
▶**PC Network** *Replacement 130 Watt IBM-PC Power Supply—Gives your PC the same Capacity as an XT. Good for add in Tape Drives (without need for a piggyback unit) and large capacity disk drives.*	70.00*	*(2.70)*
SMA *PC Doucumate; Keyboard Templates for Lotus/DBase/Multimate and others (Each)*	9.99*	*(1.00)*

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(All Memory Chips Guaranteed for Life!)

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▶**64K Memory Upgrade Kits** *(9 Chips) Quantity Discounts Available!*	$7.85*	*(1.00)*
▶**64K Dynamic Ram Chips** *(Each)*	.85*	*(1.00)*
▶**256K Dynamic Ram Chips** *(Each)*	2.25*	*(1.00)*
▶**128K IBM AT Mother Board Chips** *(Each)*	3.50*	*(1.00)*

EXTERNAL MODEMS

Anchor *Signalman Express*	$205.00*	*(5.00)*
Hayes *Smartmodem 300*	125.00*	*(5.00)*
Hayes *Smartmodem 1200*	340.00*	*(5.00)*
Hayes *Smartmodem 1200B Alone*	265.00*	*(2.50)*
▶**Hayes** *Smartmodem 2400*	535.00*	*(5.00)*
Prometheus *Promodem 1200 External 100% Hayes Compatible*	276.00*	*(6.00)*
▶**U.S. Robotics** *Courier 2400BPS Modem*	395.00*	*(5.00)*
▶**U.S. Robotics** *Password LOWEST PRICE 1200BPS Modem!*	195.00*	*(4.00)*

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Amdek *Video 300G Composite Green*	$110.00*	*(3.00)*
Amdek *Video 300A Composite Amber*	120.00*	*(3.00)*
Amdek *Video 310A IBM Type Amber*	130.00*	*(3.00)*
Amdek *Color 300 NEW! Composite*	215.00*	*(4.64)*
Amdek *Color 600 NEW! High Res RGB*	365.00*	*(7.88)*
Amdek *Color 700 NEW! Ultra High Res*	455.00*	*(9.83)*
Amdek *Color 710 NEW! 700 w/Non Glare Long Phosphor*	475.99*	*(10.48)*
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Princeton *MAX-12e Work with Color or Mono Card!*	156.00*	*(5.00)*
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▶**Samsung** *12" TTL IBM Type Amber*	85.00*	*(5.00)*
Taxan *640 Super Hi Res RGB*	495.00*	*(10.69)*
Zenith *ZVM-1230A Green High Res/Non Glare*	81.00*	*(1.75)*

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AT&T *6300 PC CPU2 128K/2 Floppy/1 Serial/1 Parallel*	$1,575.00*	*(34.02)*
AT&T *7300 Unix PC 10MB Hard Disk/1 Floppy/512K*	3,699.00*	*(79.90)*
COMPAQ *DeskPro/Tape Backup System w/640K/1 Floppy/10MB Hard Disk/ 10MB Tape Drive/Monitor*	2,446.00*	*(63.70)*
▶**COMPAQ** *Hard Disk Portable 10MB Hard Disk/Floppy/256K*	CALL	
▶**IBM** *PC Base System 2DSDD/FDC/256K*	$1,325.00*	*(30.78)*
▶**IBM** *PC Professional Hard Disk*	1,685.00*	*(36.91)*
IBM *PC/AT Base System—1.2MB Floppy/256K*	2,795.00*	*(60.37)*
IBM *AT Professional System 1.2MB Floppy/20MB Hard Disk/1 Ser/1 Par/512K*	CALL	

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▶**Citizen** *MSP-10 NEW! 160CPS/80COL/Fric + Trac*	$265.00*	*(5.72)*
▶**Citizen** *MSP-15 NEW! 160CPS/132COL/Fric + Trac*	350.00*	*(7.56)*
▶**Citizen** *MSP-20 NEW! 200CPS/80COL/Fric + Trac*	350.00*	*(7.56)*
▶**Citizen** *MSP-25 NEW! 200CPS/132COL/Fric + Trac*	499.00*	*(10.76)*
▶**Citizen** *Premiere 35 NEW! 35CPS Daiseywheel/132COL/Fric + Trac*	385.00*	*(8.32)*
▶**Epson** *LX-80 100CPS 80COL LQ Mode*	199.00*	*(4.30)*
▶**Epson** *FX-85*	299.00*	*(6.46)*
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Epson *LQ-1000 NEW! 180CPS/60CPS NLQ*	599.00*	*(12.95)*
Epson *SQ2000 Inkjet Printer*	1,359.00*	*(29.35)*
Epson *DX-35 35CPS Letter Quality Printer*	569.00*	*(12.29)*
▶**NEC** *2030 20CPS LQ Parallel*	605.00*	*(13.00)*
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▶**NEC** *3530 33CPS LQ Parallel*	888.00*	*(19.18)*
▶**NEC** *3550 33CPS Letter Quality Printer*	$ 920.00*	*(17.87)*
▶**NEC** *8850 55CPS Printer*	1,330.00*	*(28.73)*
Okidata *ML 182 New 120CPS/LQ Model Fric/IBM Graphics + more*	CALL	
Okidata *ML 192 New Sleek Design/ 160CPS/LQ Mode/Fric/IBM Graphics*	CALL	
Okidata *Color 20 80CPS/100 + Colors/LQ Mode/IBM Graphics/ + More (Requires Interface)*	CALL	
Okidata *IBM Interface for Okimate Color 20*	CALL	
Okidata *ML84P 200CPS 132COL*	CALL	
Okidata *ML93P 160CPS Wide Platen*	CALL	
Okidata *2410P Pacemark 350CPS*	CALL	
Qume *Sprint 11/40 40CPS Letter Quality*	1,155.00*	*(24.00)*
Star Micronics *Power type 18CPS Letter Quality*	300.00*	*(6.48)*
Toshiba *P1340 80COL/144CPS*	430.00*	*(9.29)*
Toshiba *New! P341 210CPS/132COL*	699.00*	*(15.09)*
Toshiba *P351 New! 288CPS/132COL*	975.00*	*(21.06)*

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***PC NETWORK—Members pay just 8% above the wholesale price, plus shipping.** All prices reflect a 3% cash discount. Minimum shipping $2.50 per order. International orders call for shipping & handling charges. Money Orders, personal and company checks please allow 10 working days to clear. All prices subject to change without notice.

†**RENT BEFORE YOU BUY**—Members are eligible to join the NETWORK's Business and Game software Rental Libraries and evaluate products for a full 14 (Regular) or 30 (VIP) days to see if it meets your needs. And The NETWORK's rental charges are far less than other software rental services—Just 20% OF THE MEMBER WHOLESALE PRICE. **Rental titles available in IBM/Apple/MAC and CP/M Formats.** Hardware prices highlited by ▶ reflect recent major price reductions.

COMPLETE SYSTEMS

(Optional local warranty service available in most major metro areas)

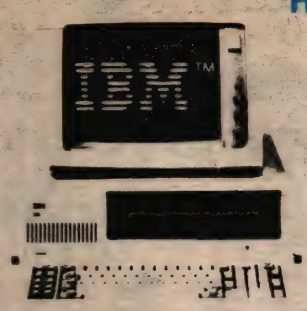
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Floppy Drive Controller
2 Double Sided Double Density Disk Drives
Mix and Match with your favorite Monitor and Printer!

$1,325.00*

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1 Double Sided Double Density Disk Drive
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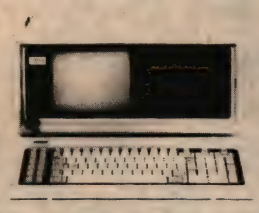
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COMPAQ™

PORTABLE HARD DISK SYSTEM

w256K/1 Floppy/10MB Hard Disk



$2,269.00* w/20MB
call for 10 MB

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10MB Tape Drive/Monitor

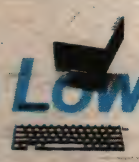


$2,446.00* w/10MB
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APPLE *IIc*



APPLE *IIe*



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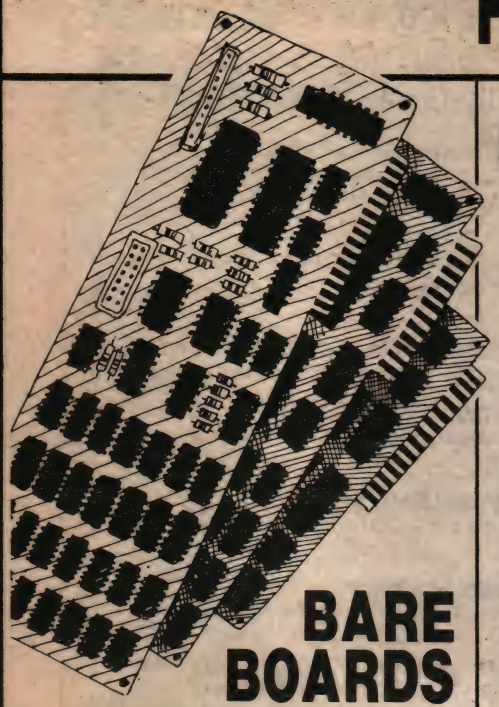
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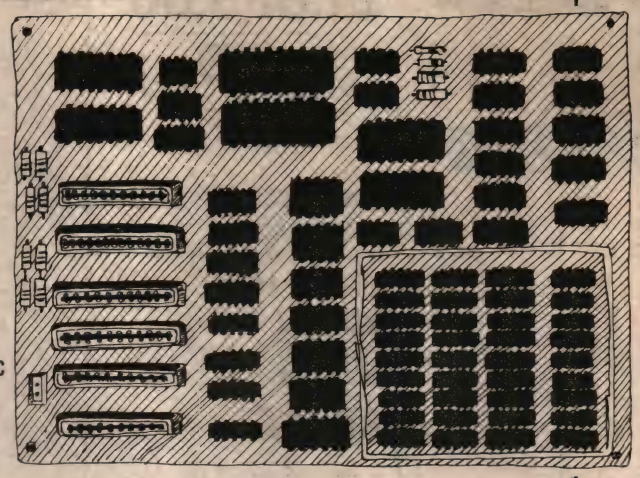
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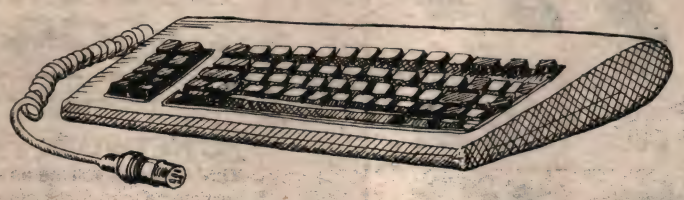
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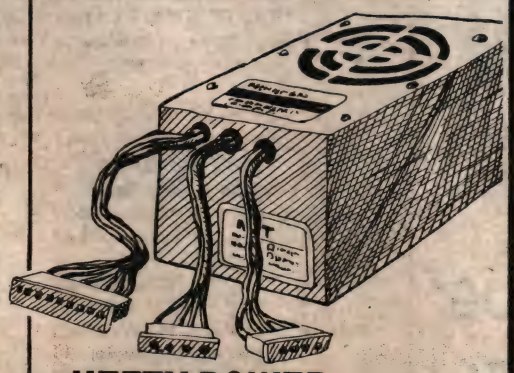
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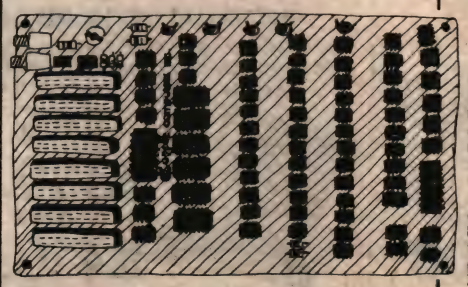
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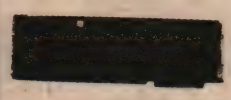
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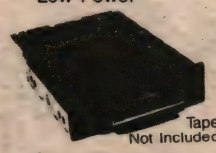
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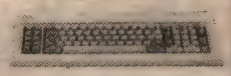
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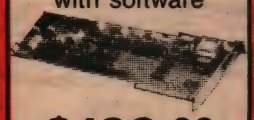
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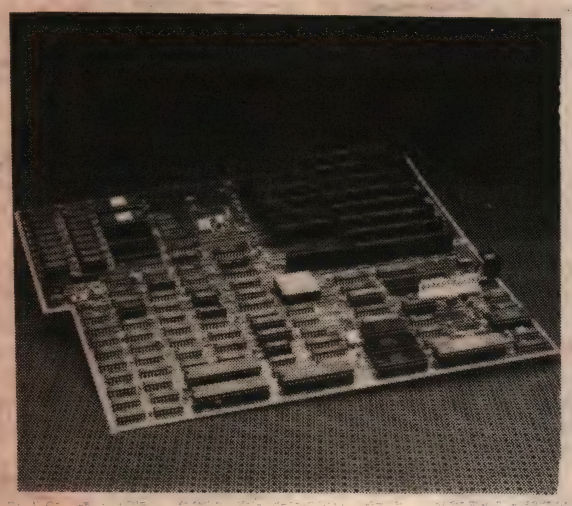
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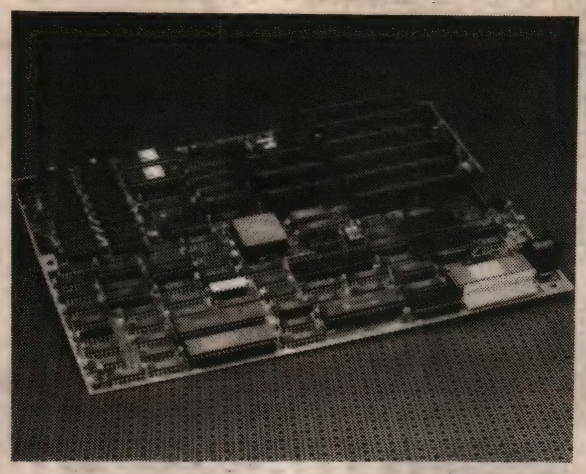
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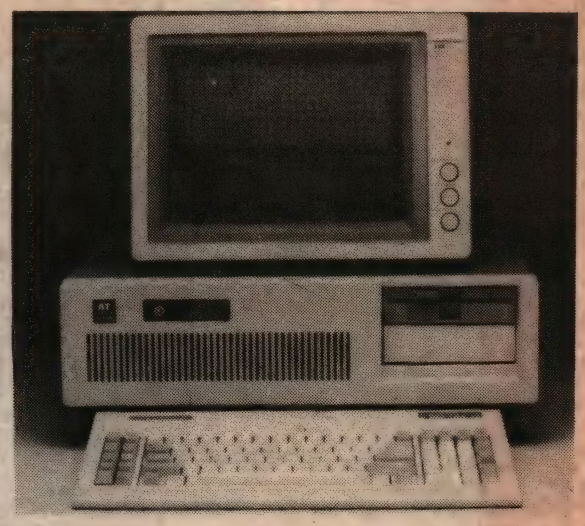


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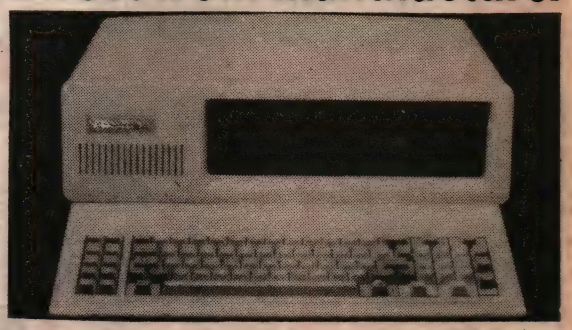


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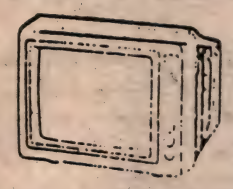
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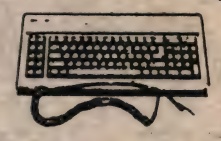


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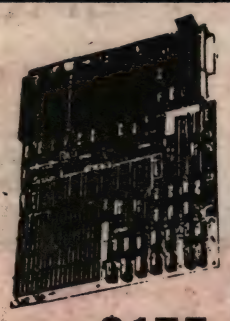


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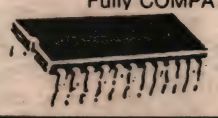
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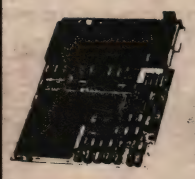
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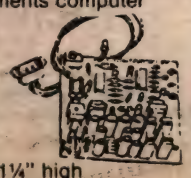
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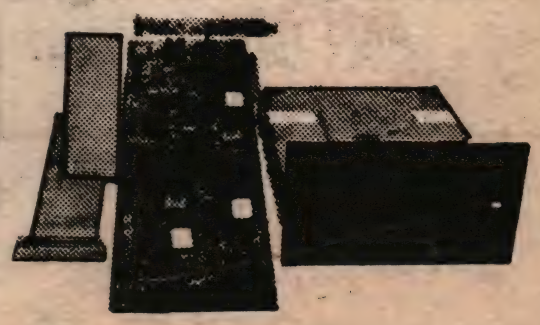
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LS112	*LS138	LS139	*LS14	*LS14	LS153	LS155	LS156	LS157	LS158	LS161	LS163
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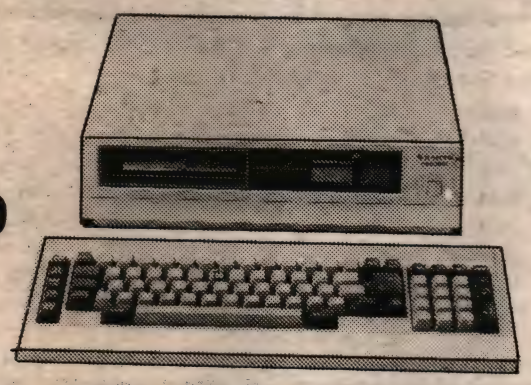
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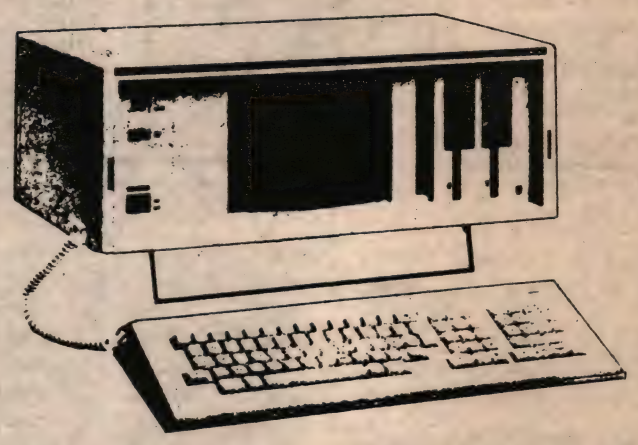
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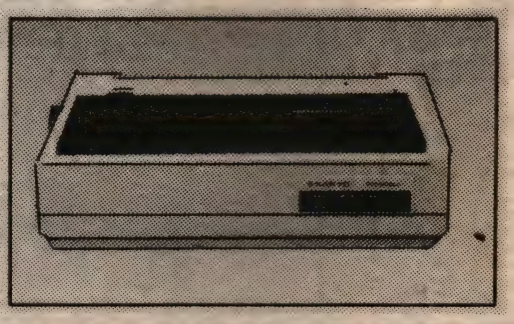
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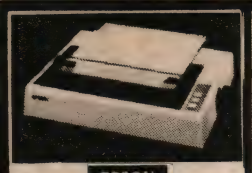
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LX-80 – 80 column, NLQ mode . Call
Tractor for LX-80 printer $25
LQ-1500 – 200cps, 24-pin head . Call

OKIDATA

182P, 120 cps, 80 Col., Parallel . .$239
84P, 200 cps, 136 col. Parallel. . $649
192P, 160 cps, 80 col. Parallel . . $349
193P, 160 cps, 136 col. Parallel. . $549

IBM

IBM ProPrinter – 200cps, 80 col .$469
IBM Color Jet – 80 column $645
IBM QuietWriter II- 60cps, 132 col.Call
IBM Wheel Printer – 25cps, 132 colCall



TOSHIBA

P351, 240cps, 136 Col., 24-pin head, plug-in font cartridge,Para.. $1,085
P341 – Like P351 but slower . . $935
P1340, 192cps, 80 Col., 24-pin . .$465
Bi-directional Tractor $195

CITIZEN

MSP-10 – 80 column. $345
MSP-15 – 132 column $495
MSP-20 – 80 column. $485
MSP-25 – 132 column $675

STAR GEMINI

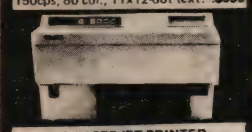
SB-10, 24-pin, 80 column . . . . .Call
SG-10/15, SD-10/15, SR-10/15 . . Call

DIABLO

Diablo 630 API, 40 cps daisywheel printer . . . . . *Sale Price* $1,295



H-P ThinkJet Ink Jet Printer
150cps, 80 col., 11x12-dot text. .$399

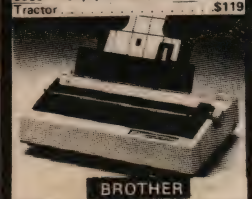


H-P LASERJET PRINTER
300cps, quiet operation, serial. $2,495
H-P LASERJET PLUS . . . . . Call



JUKI

6100 – 18 cps, 13" platen, 2K buffer, buffer, parallel. $379
6300 – 40 cps, 132 col., 3K buffer $689
Tractor $119



BROTHER

M-1509 – 180 cps, (45cps NLQ), 132 col., friction feed and the new push type pin-tractor so first form won't be wasted. IBM and Epson FX-100+ compatible. Very quiet operation. Dual interface $425
Sheet Feeder SF-40 for M-1509. . Call
HR-15XL – 17cps wheel printer CALL
2024L – 160cps, 24-pin head letter quality dot matrix prin r, 136 col. w/tractor, parallel $925
TwinWriter – Two heads are better than one! 160cps dot matrix and 36 cps daisywheel combined into one printer. Parallel interface . . .$985
HR-25 – 23cps daisywheel, para $480
HR-35 – 36cps daisywheel, para $685
DM-40 – 160cps, 24-pin dot matrix, 136 col., with tractor, para $925

FORTIS – *by Brother*

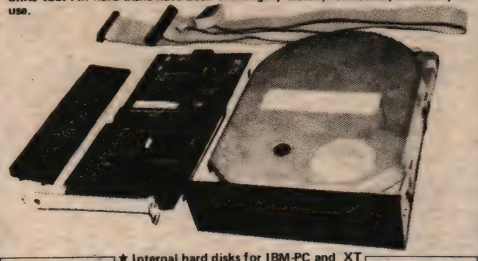
Fortis 15XL – 17cps daisywheel printer w/3K buffer. Parallel . .$SALE!
Fortis DM-20 – 160 cps dot matrix, 136 col., NLQ mode, both parallel and serial interfaces. $525
Fortis DX-25 – 25cps daisywheel, 132 column, 7K buffer, quiet operation, built-in parallel & serial. . . . . Call
Fortis DH45 – Dual head printer, 160 cps dot matrix, 36 cps daisywheel, Epson, Diablo compatible . . $999
Tractor for 15XL/HR-25. . . . . $119
Keyboard for 15XL. $149
Cutsheet Feeder for HR-15/25 . .$189
SF-200 Feeder for DM-40/2024L .$275

PANASONIC

KX-P1091, 120 cps, 80 columns, with near letter quality mode . . $259
KX-P1092 . . . . . $365
KX-P1093 . . . . . $435
KX-P3151 . . . . . $425

HARD DISK SALE!

Now is time to upgrade your computer at tremendous savings. These compact half height hard disks consume little energy and leave room for tape backup units too. All hard disks have been thoroughly tested, formatted, and ready to use.



10 MB $389 | **20 MB $489**

★ Internal hard disks for IBM-PC and XT
★ Complete with controller card, cable & mounting hardware.
★ Boots directly from hard disk.
★ Low power consumption.

For AT&T 6300 or DeskPro---add $75



HARD DISK FOR IBM-AT

Unsurpassed in quality and savings. These are internal hard disks that can be easily installed inside the IBM-AT Complete with mounting rails.

20 MB Disctron ----- $469
SEAGATE -- $665
30 MB SEAGATE -- $775



IRWIN 10-MB TAPE BACKUP

Internal half height unit. Direct connects to floppy controller card without taking up a slot. Complete w/$30 tape, software and instruction. $489



20-MB TEAC TAPE BACKUP

Super fast 4 MB per minute transfer rate. Both mirror image or file by file backup. Uses small ¼" cassette tape. Complete with interface card & tape. Internal unit – $695

External unit comes with power supply, surge protector and lighted selector switches for 3 other accessories ---- $955

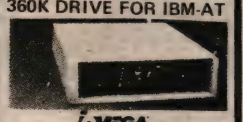
EVEREX



EVEREX 20-MB Internal Tape Back-Up for PC and XT, 4 MB/minute transfer rate. Complete w/control card, cable and manual $695
EVEREX 60-MB Internal Tape Back-Up for AT. Complete with controller, cable and manual. . .$895



$115 ea.
360K DRIVE FOR IBM-AT



MEGA

Bernoulli Box, 10+10-MB . . . $2,325
Non-bootable interface card $105
Bootable interface card. $229
3-Pak 10-MB cartridge $180



POWER SUPPLY

Replace the 65-watt power supply in your IBM-PC now. Comes with extra connector for additional drive or tape backup.
135-WATT ---------- $85
150-WATT ---------- $105

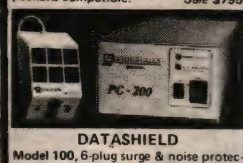


PLOTTER SALE

ROLAND
DXY-800 – 8-pen, hi-speed 180mm/sec. IBM compatible. 11x17" paper . $Call
DXY-880 – Similar to 800, 8-pen, Hewlett Packard compatible. . . .$Call
DXY-980 – above but w/digital display & electro-static paper holder. . Call

HEWLETT PACKARD
7470A – 2-pen, 8½x11 paper size $949
7475A – 6-pen, 11x17 paper size $1595

TAXAN
710S – 6-pen color plotter, Hewlett packard compatible. *Sale* $795



DATASHIELD

Model 100, 6-plug surge & noise protector w/audio & Visual warning. $65
PC-200, 200-watt backup power supply with reaction time less than 10 millisec. Built-in surge protector . $279
XT-300, above but 300-watt. . . $365
AT-500, above but 500-watt. . . $625
AT-800, above but 800-watt. . . $685

AST

Cards for IBM PC and XT w/Free Sidekick software

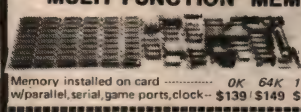


SixPakPlus Cards

Memory installed on card	64K	128K	192K	256K	320K	384K
with paralle, serial ports & clock	$219	$229	$239	$249	$259	$269
above plus game port	$254	$264	$274	$284	$294	$304

ADVANTAGE CARD for AT 128K $399 256K $429 384K $459

MULTI-FUNCTION MEMORY CARD



Fully compatible with IBM-PC and XT. Comes with Ram disk and print spooler software.

Memory installed on card	0K	64K	128K	192K	256K	320K	384K
w/parallel,serial,game ports,clock--	$139	$149	$159	$169	$179	$189	$199

Special Purpose Cards



Hercules Graphic Card	$299
Hercules Color Card – short card	$159
Paradise Multi-Display Card . . .	$275
Paradise Modular Display Card .	$285
Generic Color Graphics Card . .	$125
Generic Monochrome Card . . .	$135
Plantronic ColorPlus w/software	$379
Intel Above Board	Call
Orchid PC Turbo 186 w/256K . .	$695
Orchid PC Turbo 186 w/640K . .	$775
Sigma 400H Color for PGS SR-12	$499
Sigma 400L Color for Taxan 440/630/640 monitors	$499
Taxan 555 Hi res. color card. . .	$225
Persist BOB Board – Ultra hi res. color card. Ideal for Taxan 630/640	$389
Tecmar Graphic Master.	$495
Everex Graphic Edge	$399
PC Peacock Color Card.	$279
AST Preview graphics w/para. . .	$299
Parallel Printer Card – Half size. .	$69



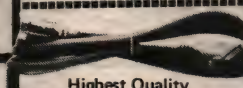
COMPAQ

Compaq Portable, 256K, 2 drives $1,850
Portable 286, 256K, 1 drive . . $3,180
Portable 286, 640K, 1.2-MB drive, 22-MB harddisk $4,495
Portable 286, 640K, 1.2-MB drive, 22-MB harddisk, 10-MB tape . $5,150
DeskPro w/256K, 2 drives . . . $1,925
DeskPro w/256K, 1 drive, a 10-MB hard disk $2,650
DeskPro w/640K, 1 drive, a 10-MB hard disk, a10-MB tape backup . $3,750
DeskPro w/640K, 1 drive, a 20-MB hard disk, a 10-MB tape backup. $4,295
DeskPro-286, 256K, 1.2-MB dr. $3,295
DeskPro-286, 512K, 1.2-MB drive, 30-MB harddisk $4,495
DeskPro-286, 512K, 1.2-MB drive, 30-MB harddisk, 10-MB tape . $4,995
Compaq amber monitor $239
Compaq DOS (needed for DeskPro) $60



Modem Sale!

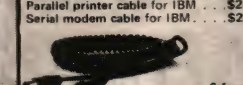
Hayes 300, external, 300 baud . $145
Hayes 1200, external, 1200 baud $365
Hayes 1200B, internal w/software $339
Hayes 2400, external 2400 baud $579
AST Reach, 1200 baud internal .$435
Watson Voice/Data Modem . . . . Call
Watson VIP $275
Prometheus 1200 external $295
Prometheus 1200B internal $265
Everex 1200B internal modem . . $225



Highest Quality Shielded Cables

These cables are the very best money can buy. Lifetime warranty. List $65.

Parallel printer cable for IBM . . .$25
Serial modem cable for IBM. . . .$25



6-foot Keyboard extension cable for IBM-PC & XT. . . . $8



RS-232 SURGE PROTECTOR

Protects RS-232 port from large voltage peaks caused by lightning or other power problems. $15

RS-232 TESTER

In-line testing of any RS-232 interface. Has 7 LED indicator lights. Requires no battery $25

RS-232 PATCH BOX

Complete with patch wires to solve all handshake problems. $25



DATA SWITCHES

High quality rotary selector switches direct the flow of data to and from computers, printers, modems, plotters, etc. Fully shielded beige metal housing. 2 amp capacity.

DB-2525-2V (1 in, 2 out), RS232 DB-25 female connectors. $95.00
DB-2525-4V (1 in, 4 out), Use pin 1 as common ground. $109.00
2525-X, AaBb-AbBa/2 in, 2 out. .$119
CN-3636-3V (1 in, 3 out), Centronic 36-pin female connector $145.00
CN-3636-4V (1 in, 4 out), As above but with 4 outlets. $149.00
3636-X, AaBb-AbBa/2 in, 2 out. .$159



Canon PC

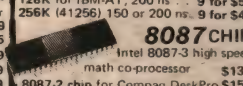
PERSONAL COPIERS

PC-10 Copier – Manual feed, compact size . . . . . ($795) $475
PC-20 Copier – 100-sheet feeder, 1-19 copies. . . . . ($1,095) $659
PC-25 Copier – Make copies up to legal size from original as big as 10x14. Enlarge 120%, reduce 67% or 78%. . . . . ($1,395) $839
Black toner/drum cartridge $59
Blue, brown, red cartridge $69
Legal cassette for PC-25 . . . . $19



DYNAMIC RAM CHIPS

64K (4164) 150 ns $1.50 ea. 9 for $10
128K for IBM-AT, 200 ns . . 9 for $54
256K (41256) 150 or 200 ns. 9 for $45



8087 CHIP

Intel 8087-3 high speed math co-processor $135
8087-2 chip for Compaq DeskPro $155
80287-3 chip for IBM-AT . . . $199



AT&T 6300 COMPUTER

640K memory, 1 floppy drive, serial & parallel ports, clock, Monochrome and RGB color ports, keyboard . . .$1695
Above with two 360K drives..... $1,895
640K memory, 1 floppy drive, 20-MB hard disk, serial, parallel ports, clock, mono & RGB ports, keyboard. $2,395
AT&T Green Monitor $259
Taxan 630 super high resolution color monitor . . . . . CALL
D.O.S. $65

MONITOR SALE



PGS HX-12, 12" RGB color, high resolution 690x200-dot 16-color, matching IBM case **Sale $445**

★★★★ RGB COLOR ★★★★

SONY KV-1311CR – RGB Color Monitor, 680-line resolution, also a Trinitron Color TV with remote control . . . *A Fantastic Buy* $495
PGS SR-12E – Super high resolution RGB Color Monitor, operates w/ Sigma 400H Color Card . . .$595
Quimax PX-IV – 13" RGB, 720x240 line. Has green switch, tilt & swivel base $445
Taxan 620 RGB Color Monitor . Call
Taxan 630 RGB Hi Res. monitor. Call
Taxan 640 RGB Hi Res. monitor . Call

★★★ GREEN SCREEN ★★★

Taxan 121, 12" green, 1000x360 dots, TTL monochrome $155
Quimax DM-14G – 13" green TTL, 750x350 resolution, tilt & swivel base included. 1 yr. warranty $145
Taxan 115, 12" green composite .$125
IBM Monochrome, 12", 720-dot .$255

★★★ AMBER SCREEN ★★★

Amdek 300A, 12" amber $149
Amdek 310A, 12" amber, 900 dots, non-glare screen, runs off IBM monochrome interface board .$169
Quimax DM-14A – 13" amber TTL, 750x350 resolution. Tilt & swivel base included. 1 yr warranty $149
Princeton MAX-12, 12" amber, 720 x 350 dot, runs off IBM monochrome display adapter $169
Taxan 122, 12" amber, 1000x360 dots, TTL monochrome $159
Taxan 116, 12" amber composite $129

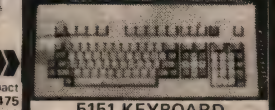
★★★ BLACK & WHITE ★★★

Roland MB-142, 14" reversible black & white TTL monochrome monitor w/ super hi res. 720x350 dots. . .$Call



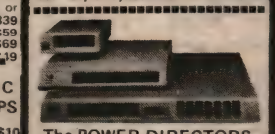
SOFTWARE

Lotus 1-2-3-	$319
SYMPHONY	$419
dBASE II.	$275
dBASE III	$369
FRAMEWORK	$369
WORDSTAR PRO PAK	$279
WORDSTAR 2000	$259
WORDSTAR 2000+ w/telemerge	$299
Word Perfect	$199
PC Mouse with Paint Brush . . .	$129
Dollars & Senses	$119
Multimate	$239
Turbo Lightning	$69
Reflex	$69
Side Kick	$49
IBM DOS 2.1 or 3.1	$69
IBM Top View	$119



5151 KEYBOARD

A quiet, soft-touch keyboard for IBM PC, XT or Compaq Desk-Pro. . . $125
"AT" Style keyboard for PC & XT $159



The POWER DIRECTORS

P-22 – A unique control center & surge protector w/4 lighted and a master switches for computer, printer and accessories. It also filters out EMI & RFI interferences $79
P-2 – like P-22 but w/5 switches $109
P-12 –Has 6 switches & clock. . .$149

IBM PC XT AT

SALE PRICES

All systems include keyboards and disk controllers. Monitors are available at big savings too.



	1-Drive	2-Drive	10-MB	20-MB	30-MB	Tape
PC 256K	$1350	$1495	$1895	$1995	$2295	add $475
XT 256K	$1795	$1950	$2395	$2495	$2895	add $695
AT 512K	$2995	$3195		$3995	$4395	avail w/1 dr. $899

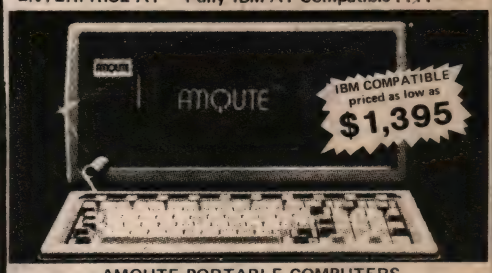


ENTERPRISE

OFFICE COMPUTER SYSTEMS

- Fully IBM PC/XT Compatible
- Full one-Year Warranty
- 640K memory on mother board
- 150-watt Switchable Power Supply
- 8 Expansion Slots

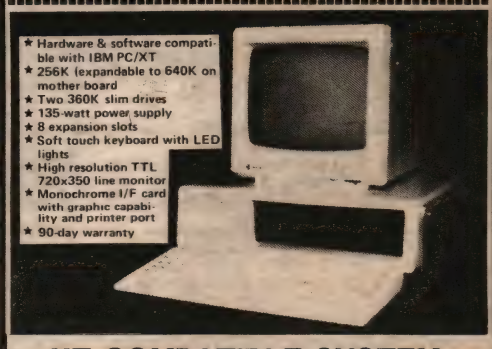
ENTERPRISE XT – 640K CPU and Keyboard. **$595**
ENTERPRISE XT – 640K, two 360K drives, controller & I/O card with 2 serial, 1 parallel, 1 game port and clock/calendar, Keyboard . . . . . *Special Sale Price* $888
ENTERPRISE XT – Same as above but with a 20-MB hard disk . . . . . *Special Sale Price* $1,388
ENTERPRISE XT-PLUS – This is fast 8-MHz machine! Basic 640K CPU and Keyboard. $749
ENTERPRISE XT-PLUS – 640K, two 360K drives, 2 serial, 1 parallel, 1 game ports, clock/calendar and keyboard. . . . . *Introductory Special* $1,195
ENTERPRISE XT-PLUS – Same as above but with a 20-MB hard disk. . . . . *Introductory Special* $1,595
ENTERPRISE AT – Fully IBM-AT Compatible . . . CALL



AMQUTE PORTABLE COMPUTERS

Introducing a powerful portable computer that is smaller than the Compaq, more flexible than the IBM Portable, yet so reasonably priced!

704K memory on mother board, two 360K drives ---------- $1,395
704K memory on mother board, one 360K drive, one 10-MB hard disk ---------- $1,995
Above with 20-MB hard disk ---------- $2,195



★ Hardware & software compatible with IBM PC/XT
★ 256K (expandable to 640K on mother board
★ Two 360K slim drives
★ 135-watt power supply
★ 8 expansion slots
★ Soft touch keyboard with LED lights
★ High resolution TTL 720x350 line monitor
★ Monochrome I/F card with graphic capability and printer port
★ 90-day warranty

XT COMPATIBLE SYSTEM

A Complete, ready to run computer system at BARGAIN BASEMENT PRICE **$875**

All goods are brand new and guaranteed. All advertised prices already include a 2% cash discount for full payment by cashier's check, money order or cash. Personal or company checks must clear 3 weeks before we ship. Add 2% for credit card purchases. COD's are accepted for UPS shipments only and require 20% paid deposit and $3 COD fee. No COD's to Canada, Puerto Rico, FPO/APO or P.O. Boxes. Shipping & insurance charges: 3% (Min. $3) of total order value by UPS ground, 5% (Min. $5) by UPS Blue & Parcel Post. P.O.'s accepted from government agencies, Fortune 1000 firms and major institutions. Calif. buyers add sales tax. Prices subject to quantity available, correction or change without notice. You may call for the latest prices. Our high volume & low margin pricing assure you consistent savings on all computer hardware & software.

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IBM CLONE HEADQUARTERS

IBM™ AT COMPATIBLE!

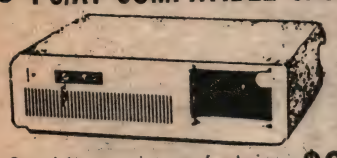
● PC/AT MOTHER BOARD



$795.00

- IBM/AT Compatible
- 640K Installed
- ROM BIOS Included
- 8 I/O Slots
- On-Board Clock
- 1 yr. warranty
- Exact IBM Look-A-Like

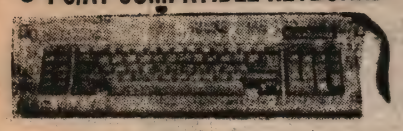
● PC/AT COMPATIBLE CASE



$99.00

- Complete corrosion-proof exterior
- Anti-electric conduct
- Include keylock assembly, drive rail, speaker holder and accessories for easy assembly.

● PC/AT COMPATIBLE KEYBOARD



- MFG by Maxi-Switch
- 3 LED's

$79.95

● 200 W AT POWER SUPPLY



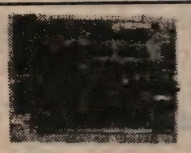
$145.00

● FLOPPY & HARD DRIVE CONTROLLER



DTC CONTROLLER 5290 $255.00

MULTI I/O $99.00



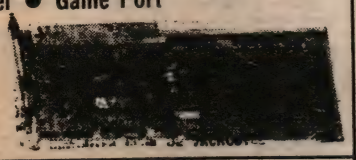
- Serial & Parallel Ports

SHORT CARD

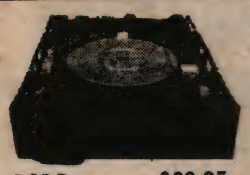
1.5 MB MULTI FUNCTION

- Expandable to 1.5 MB
- Serial
- Parallel ● Game Port

$269



AT/DRIVES



360K - ½ hgt. DSDD	$69.95
1.2 Meg Quad	$145.00
20 Meg. (45Msec)	$585

SPEED UP YOUR IBM OR COMPATIBLE BY 33% — $14.95

New V-20 CPU Mfg. by NEC replaces the 8088 in your system. No compatibility problem. New on market so order early before high demand makes these scarce!



TAIWAN BASIC

Rub Basic in your IBM Clone out of EPROMS.

$39.95/per set

KEYBOARD



For AT or XT
Switch Selectable

5150 Type	$79.95
5151 Type	$95.00

POWER SUPPLY



135 WATT $79.00

$1479.00 20 MEG TURBO COMPUTER

A NO NONSENSE FULL BLOWN BUSINESS COMPUTER SYSTEM

- Dual speed (5 & 7 MHZ)
- Dual ½ drives (DSDD)
- 20 Meg. & Controller
- Parallel, Serial, Game, Clk/Cal.
- 640K Memory
- Composite Amber Monitor
- Color Graphics Card
- Compatible keyboard
- 135W Supply



● DOS 2.1 Operating System ● Bundled Software
● 1 Yr. Warranty ● No Hidden Extras

MONITORS



SAMSUNG COMPOSITE MONITORS

12" Amber Composite	$69.95
12" Green Composite	$67.95

NEC COMPOSITE MONITORS

12" Amber Composite	$79.95
12" Green Composite	$74.95

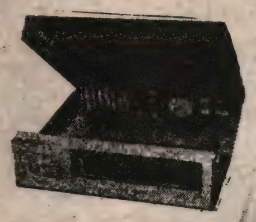
RGB MONITORS

Roland 12" RGB	$325.00
NEC 14" RGB	$295.00
Cables for RGB Monitor	$9.95



COMBO FLOPPY/HARD DISK CONTROLLER

Controls 2 floppy & 1 hard disk
5 to 100 meg. Stk. #FDC 550 ...$179.00



COMPUTER CASES

XT Type Cases

IBM LOOK-A-LIKE CASE

- Slide-Off Cover
- Requires Side Switch Power Supply
- For Exact IBM Foot Print Boards Only
- 8 Slots in Rear

Case-60 ..... $49.95

HINGED TOP CASE

- Flip top case
- Requires side switch power supply
- Fits all clone boards
- 8 slots in rear

Case-50 ..... $49.95

HINGED TOP CASE

- Flip top cover
- Requires rear switch power supply
- Fits all clone boards
- 8 slots in rear

Case-50 ..... $49.95

MODEMS



103/212A —
Operates at 300 baud and 1200 baud

- Bell 103 and 212A compatible
- Hayes compatible
- Auto Answer, Dial and Redial
- External speaker for monitoring calls
- AC Adapter supplied

INTERNAL	$159.00
EXTERNAL	$175.00

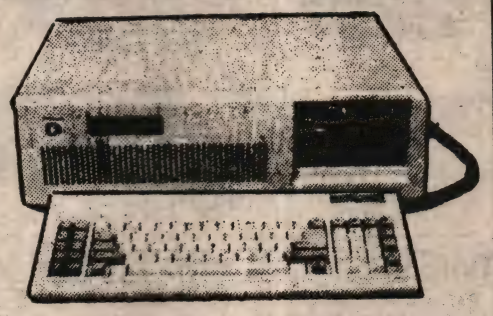


EXTERNAL DRIVE CASE & POWER SUPPLY

- 75 W Power Supp.
- Drive Power Connect.
- IBM Styling

$99.00

IBM AT CLONE COMPUTER



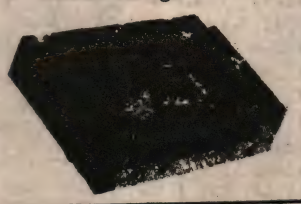
- 80286 Based System ● 1 Meg Memory
- Combination floppy — hard disk controller
- 1.2 Meg floppy drive & all cables
- 2 Serial, 1 parallel port, clk/cal
- 192 Watt power supply ● AT Keyboard
- Runs all major IBM Software
- Monochrome Card & Monitor

$2149

DSDD - 40 TRACK DISK DRIVES

Qume 142A	$79.95
Control Data - CDC9428	$84.95
Tandon 50-2	$79.95

All ½ Hgt.



EASY MEMORY EXPANSION



Memory expansion PROMS expand the memory on your IBM XT or Compaq to a full 640K on the motherboard. No expansion board necessary! Complete w/instructions.

Stk. #IBM-640P	$39.95
Stk. #COMPAQ-640P	$39.95

RAM CHIPS

4164-150	$.75
41256-150	$3.00

RAM TEST PROGRAM



A must for all IBM clone assemblers. Tests full 640K of memory and prevents you selling computers with parity problems. Saves you money!

Stk. #DK-RMTST $9.95

IBM CLONE TECH MANUAL!!

Did you buy a clone machine and didn't get any kind of operations manual? We put together an extensive manual that tells you how to hook everything up, how it works, & troubleshooting techniques. Covers both XT and Turbo-XT systems. Complete w/schematics.

Stk. #XT-Book $24.95

NEW

DISKETTE DUPLICATOR



Stand-a-lone unit will copy information from one diskette - track by track - to another diskette. No computer needed! Copies all format diskettes as well as all copy protected diskettes. Takes only 45 seconds to copy. Extremely easy to use.

$795

IBM ADD ON BOARDS



STOCK#	DESCRIPTION	PRICE
FDC-501	Floppy disk controller w/cable - 4 drives	$40
FDC-507	Floppy Cont. w/serial, parallel & clock	$109
HDC-515	Hard disk controller w/cables (Omti)	$139
VID-401	Color Graphics Cards, IBM Specs.	$70
VID-405	Magic Video card w/TTL, RGB, & Composite outputs 640x400 color, 640x352 monochrome	$185
VID-406	Monochrome (TTL) card	$75
VID-408	Hi-Res mono/graphics w/printer port Hercules compatible	$85
SIO-250	Serial port card (second serial opt.)	$35
PIO-255	Parallel printer card	$29
MFC-110	Short I/O, parallel, serial, clk/cal	$99
MFC-100	Multi-funct. w/para., ser., clk/cal & 384K Exp. No mem. installed. Software	$90
MFC-120	576K memory expansion board (short card)	$60
EP-128	EPROM burner board, for IBM (2716-27128)	$129
RD-2	Bus Receiver & driver boards for Exp. chasis	$149



SUPER SURGE HASH FILTERS $15.00

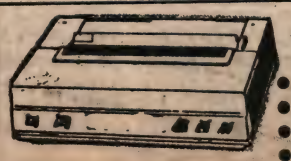
6 Outlets, Fused, Mov. & LC Circuits

NEW IBM COMPATIBLE TEXAS ROM BIOS



A new 2 chip bios set that replaces the existing ROM bios on your compatible XT or Turbo-XT motherboard. These eliminate many timing, parity, & system errors. Also eliminates the occasional "hang up" problems in the Turbo XT boards. Runs all software for IBM computers.

Stk. #TX-BIOS2 .....$24.95



C. ITOH PRINTER MODEL #

- 120 CPS Print Speed
- Tractor/friction feed
- Parallel interface
- IBM graphics compatible
- Narrow carriage

LOLIR LECTRONICS CORP.

13933 N. CENTRAL EXPRESSWAY
SUITE 212
DALLAS, TX 75243
214-234-8032 — 214-234-8056

TERMS: Check, M.O. or MC/Visa. COD's add $1.90. Shipping add $3.50. TX Res. add 6-1/8% Tax.

master charge VISA

MORE COMPUTER SURPLUS BARGAINS

NEW TEXAS XT BOARD



- 256K Standard (640K Max)
- 6.77 MHz Operating Speed
- Completely IBM Compatible
- 8 I/O Slots ● IBM Footprint
  Tested w/256K

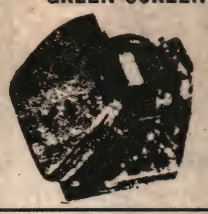
STK #XTurbo-640 .....$205

IBM COMPATIBLE SOFTWARE

PC-Write—	Word Processor
PC-File—	Database Manager
PC-Calc—	Spreadsheet
PC-Desk—	Desk-Top Manager
Toolbox 1—	DOS Utilities
Toolbox 2—	DOS Utilities
Toolbox 3—	DOS Utilities
Games 1—	Arcade Games
Games 2—	Arcade Games
PC-Business—	Business Account
PC-Home—	Home Management
PC-Modem—	Modem Program

$3.75 PER DISKETTE

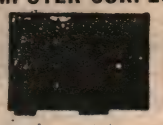
SAMSUNG 12" TTL GREEN SCREEN MONITOR



REQUIRES 15VDC IN. TTL GREEN SCREEN

$19.95

RADIO-SHACK COMPUTER SURPLUS



TRS-80 Mod III motherboards populated boards with all IC's except ROM & RAM. We have a ton of these to close out!

TR-3A complete undamaged boards, easy to bring up **2/$24**
TR-3B damaged boards with hole or corner clipped .....**3/$14**
Mod III ROM set **$20**
Mod III RAM set **$15**

TANDY 2000 MOTHERBOARDS
Assembly line rejects. Circuit boards are undamaged. These boards are very repairable. No RAM, ROM or PROM installed.
Stk. #TRS-2000D **$29.95**

MODEL 3 KEYBOARD CAPS
A complete set of key caps to replace your lost or broken keys. 100 sets available.
Stk. #TRS-3KC **$6.95/set**

KEYBOARD SWITCHES
We have Radio Shack keyboard replacement switches to fit just about every model.
Stk. #TRS-SW.....**2/$1.50**

REPLACEMENT ANTENNAS
Replacement antenna for Tandy Radios. Fits many models.
Stk. #TRS-Ant .....**3/$1.00**

TI COMPUTER SURPLUS

TI 640 OFFICE SYSTEM REPLACEMENT PARTS

CRT Controller boards	$79
Floppy controller boards	$85
AU boards	$50
SM1/M boards	$50
8" Disc drives	$70
Power supply	$85
Front door panel	$45
Rear door panel	$40

TI 990 COMPUTER SURPLUS

MAIN Chasis w/card slots, front panel & power supply $125
Dual 8" Drives w/power supply .$125

TI COMPUTER FLOPPY DRIVE CABLES



SINGLE FLOPPY DRIVE CABLE
Cable is 15" long with 34 pin card edge & 34 pin header conn.
CFS-15 .....**$2.00 ea or 10/$14**

DUAL FLOPPY CABLE
Cable is 34" long w/3 34 pin edge connectors.
CFS-30 .....**$4.00 ea or 10/$25**

TI 99-4A SURPLUS



SOUND & VIDEO MODULATOR

TI #UM1381-1 — can be used with all video sources. Built-in A-B switch. Channel 3 or 4 output. Requires 12VDC power **$3.50**



KEYBOARD

PN 900181 — 48 keys. Measures 4"x9". Terminates to a 15 pin connector **$3.75**



SWITCHING POWER SUPPLY

INPUT: 14 VAC to 25.5 VAC.
OUTPUT: +12VDC @ 350MA.
+5VDC @ 1.2AMP



WALL PLUG ADAPTER

TN-21 — used with the above power supply. Output 21VAC @ 45VA.
TN-21 .....**$3.50 ea or 10/$19.95**



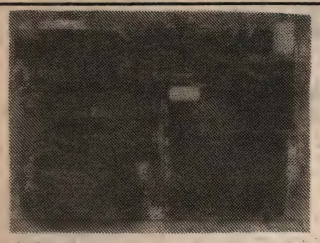
CASSETTE INTERFACE CABLE

CIC-93 — has DB-9 connector on one side to 3 RCA phono jacks on the other end .....**$1.50 ea or 10/$10.00**



TI GAME CABLE

CAB-15 — one end has a DB25 female going to 2 DB15 female connectors. Cable is 6' long **$4.00**



- 256K Max
- 8 Slot
- 4.77 MHZ Speed

$140 — W/OK

STANDARD XT REPLACEMENT MOTHERBOARD

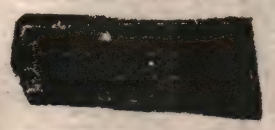
HARD DISK DRIVES



20 Meg. CMI w/controller	$440
10 Meg. Miniscribe w/cont.	$340
20 Meg. only	$325
10 Meg only	$235
Controller w/cab.	$135

EPROM PROGRAMMER

Programs 2716-27512
Programs up to 4 EPROMS At A Time



Stk. #EPP-512.....**$179**

NEW PORTABLE HOUSING FOR IBM CLONES

- Keyboard
- Case
- 9" TTL Amber Monitor
- 135 Watt Supply



Similar in appearance to the Compaq Portable. Fits all standard IBM Footprint boards.

$625.00

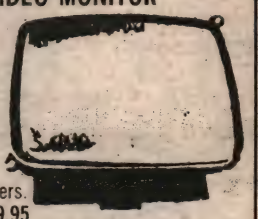
IC BARGAINS

LS00 ...$.15	LS123 ..$.42	LS240 ..$.60
LS01 ...$.15	LS124 .$1.40	LS241 ..$.60
LS02 ...$.15	LS125 ..$.30	LS242 ..$.90
LS03 ...$.15	LS126 ..$.40	LS243 ..$.80
LS04 ...$.15	LS132 ..$.40	LS244 ..$.50
LS05 ...$.15	LS133 ..$.25	LS245 ..$.50
LS08 ...$.15	LS138 ..$.35	LS251 ..$.45
LS09 ...$.15	LS139 ..$.30	LS253 ..$.40
LS10 ...$.15	LS145 ..$.55	LS257 ..$.45
LS11 ...$.15	LS151 ..$.40	LS258 ..$.50
LS12 ...$.25	LS153 ..$.30	LS259 .$1.00
LS13 ...$.30	LS154 ..$.75	LS260 ..$.40
LS14 ...$.25	LS155 ..$.40	LS266 ..$.30
LS15 ...$.30	LS156 ..$.40	LS273 ..$.75
LS20 ...$.15	LS157 ..$.30	LS279 ..$.30
LS21 ...$.18	LS158 ..$.40	LS280 ..$.80
LS27 ...$.21	LS160 ..$.50	LS283 ..$.35
LS30 ...$.15	LS161 ..$.40	LS290 ..$.65
LS32 ...$.20	LS162 ..$.60	LS293 ..$.75
LS33 ...$.25	LS163 ..$.35	LS298 ..$.65
LS37 ...$.30	LS164 ..$.50	LS299 .$1.50
LS38 ...$.25	LS165 ..$.80	LS322 .$2.50
LS42 ...$.30	LS166 ..$.75	LS323 .$2.25
LS51 ...$.20	LS169 .$1.00	LS364 ..$.90
LS54 ...$.25	LS174 ..$.35	LS366 ..$.40
LS55 ...$.20	LS175 ..$.35	LS367 ..$.40
LS73 ...$.30	LS181 .$1.25	LS368 ..$.30
LS74 ...$.23	LS191 ..$.80	LS373 ..$.50
LS85 ...$.45	LS192 ..$.70	LS374 ..$.75
LS86 ...$.19	LS193 ..$.74	LS375 ..$.35
LS93 ...$.50	LS194 ..$.60	LS377 ..$.90
LS107 ..$.28	LS195 ..$.50	LS378 ..$.80
LS109 ..$.20	LS196 ..$.70	LS390 ..$.80
LS112 ..$.30	LS197 ..$.75	LS393 ..$.75
LS122 ..$.35	LS221 ..$.50	LS399 .$1.00
		LS670 .$1.24

METAL FILLER BRACKETS FOR CLONE CASES

Plain	$.25
Video	$1
RS232	$1

9" HIGH RESOLUTION (TTL) VIDEO MONITOR



NEW

Green Screen
12 VDC Required
Originally used in portable computers.
Stk. #964-02 .....**$19.95**

2ND SERIAL PORT CHIP SET

8250
1488 **$7.50**
1489



31/62 EDGE CONNECTOR FOR IBM CLONE BOARDS

$2.25



MFG. BY ELSTON

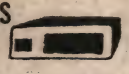
COMMODORE SURPLUS

12" GREEN SCREEN MONITOR

Composite video input built in power supply. Requires 18VAC XFMR.
Useable on IBM's **$19.95**
Transformer for above **$3.50**

NEED MORE SLOTS FOR YOUR IBM?

EXPANSION CHASIS FOR IBM'S



Case	$59.95
Exp. Board	$69.95
Power Supply	$69.98
Driver - Rec.	$149.00



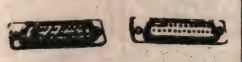
SHUGART 8" DISC DRIVES FOR XEROX 820 $65.00

SSDD

EPROM

2716	$2.00
2532	$2.75
2732	$2.25
2764	$2.75
27128	$4.50

Popular DB Series Computer Connectors



9 **Male** solder pot	$1
9 **Female** solder pot	$1
9 hoods	$.65
25 **male** solder pot	$1.25
25 **female** solder pot	$1.25
25 hoods	$.75

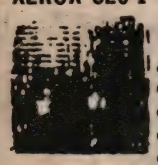


BIZCOMP VERSAMODEM

Sends and receives at 300 baud selectable originate/answer modes. Full duples operation. Bell 103 compatible. Comes with AC adapter.

Compatible with all computers having RS 232 port **$34.95**

XEROX 820-1



XEROX 820-1 Z80 SINGLE BOARD COMPUTER

- 64K RAM
- 80 x 24 Video
- Floppy disk controller
- 2 parallel ports
- 1 serial port

Asseembled & Tested $89.95

XEROX 1810 MOTHERBOARD
The 1810 is a portable CPM machine that never made it into mass production. These Z-80 Motherboards are becoming collectors items. These boards have on-board serial, parallel, video w/RF modulator, & 64K memory. Boards are solder line rejects and are missing some chips. ROM set included. Limited quantity so order early!
Xerox Xerox-1810 .....**$39.95**
CPM Boot Disk **$6.00**
Power Transformer for 1810 ..**$12.50**



BULK DISKETTES DSDD $.65 EACH



This A-B switch lets you share your computer with any two peripherals (serial or parallel). All 25 lines are connected. Has one DB25 female input & two DB25 female outputs.
Stk. #AB25 .....**$39.95**

KAYPRO SURPLUS

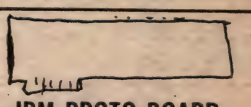
KAYPRO EQUIPMENT

81 Series ROMS (K2)	$7.00
Keyboard (K2 New)	$75.00
Keyboard Siemens w/case	$65.00

KAYPRO MAINBOARDS

K2 socketed (no ICs)	$27.50
K2 populated, tested	$129.00
K10 tested	$225.00
Pro-8 Upgrade kit	$39.00





IBM PROTO BOARD ORIGINAL IBM $34.95

MORE XEROX SURPLUS FOR 820-II

820-II Motherboard Tested **$125**
8/16 Processor bd. run MS DOS on your Xerox **$85**

LOLIR LECTRONICS CORP.

13933 N. CENTRAL EXPRESSWAY
SUITE 212
DALLAS, TX 75243
214-234-8032 — 214-234-8056

TERMS: Check or M.O. COD's add $1.90. Shipping add $3.50. TX Res. add 6-1/8% Tax.

master charge VISA

214-234-8116 ELECTRONIC SURPLUS SPECIALS 214-234-8105

MACHINE PIN SOCKET



22 PIN GOLD PLATED SOCKET
5 pcs $1.00
Stk. #ICS-22M

$.75 ROCKER SWITCH

16 Amp On/Off
Used in Xerox 820 Computers

Full Wave Bridge 6AMP-300V

2/$1.00

MINI-TOGGLE SWITCH

5AMP DPDT
$.65 EA
10/$4.50

SNAP ACTION SWITCH



MICRO-SWITCH
ASS'T OF 10
$2.50
STK #500-10M

DISK DRIVE MOUNTING SCREWS

20 for 50¢

CIRCUIT BOARD BONANZA



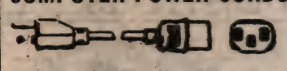
Soung generator boards removed from electronic pin-ball games. Contains oscillators, control circuits & 2 watt audio amp. Experimenters dream!!!
$2 ea — 10/$12.50 w/schematics

5V & 12V REGULATOR BOARD
Regulator board containing 5V & 12v TO-220 regulators, fuses, bridges, caps & I/O connectors. Size 2"x4" w/heatsinks.
REG-512 ..... $3.50

RECTIFIER BOARD
Contains (4) 10 Amp bridges, (3) large filter caps, & I/O conn. Size 4.5"&8".
BRDG-4 .... $2.50ea or 10/$12.50

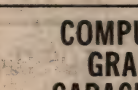
LINEAR & CMOS BONANZA
Circuit board removed from SINGER electronic calculators. Has 20 linear & cmos IC's & a wealth of other parts.
BD-20 .... $2.50 ea or 10/$12.50

COMPUTER POWER CORDS



$1.25 EA — 10/$10

12 VDC TOY MOTOR



Stk. #MO-12 ..2/$1.00

COMPUTER GRADE CAPACITORS



Ass't of 10
Stk#CCG-10 ..... $2.50

CPM DISKETTE FOR USE WITH NEC V-20 PROCESSORS

$3.75

POWER SUPPLY MFG. BY GENERAL INSTR.



INPUT: 110VAC
OUTPUT: +5VDC @ 5AMPS
+12VDC @ 2.5AMPS
−12VDC @ 3AMPS
PS-120 ..... $24.50
Used is some Commodore comp.

WALL PLUG ADAPTERS



6VDC @ 300ma
$1.75 or 10/$12.50

ISOLATION TRANSFORMER



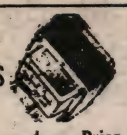
117VAC:
117VAC @ 125VAC
MFG BY SIGNAL TRANS
$3.00 Each - 10/$20.00

RIGHT ANGLE HEADERS



40 Pin ..... $.40
34 Pin ..... $.50
10 Pin ..... $.25

TRANSFORMERS



STK.#	PRI (VAC)	Secondary (VAC)	Price
TN-6.3	117	6.3 @ 300ma	$1.25
TN-12	117	12 @ 400ma	$1.35
TN-24A	117	24 @ 200ma	$1.25
TN-24B	117	24ct. @ 3.6 Amp	$3.50

HEAT SINK TO-3 $.25



LOAR RESISTOR FOR IBM POWER SUP.



5 Ohm @
25 watts
$1.79
Stk# RIBM-5

APPLE III MEMORY EXPANSION BDS

$15.00
w/OK memory

DB-25 USED Connector Ass't

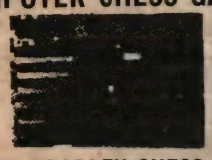
10/$2.50

GOODIES!

Delta Design Table Top Temp. Chamber $100
Altos Computer $250
Sanyo CMP/M Computer $250
Xerox 820-11 Comp $550
Box of 50 pcs waveguide & antenuators $100

CALL FOR OUR NEW FLYERS

COMPUTER CHESS GAME



MILTON BRADLEY CHESS GAME
Electronic circuit board removed from famous toy maker's game. Board has 6502 processor, 74LS series ic's, buzzer & many other useful components. Boards are complete and undamaged. MB part #7924243001.
BD-792 $3.95 ea. ..... 10/$24

Components Ass't Your Choice $2.75

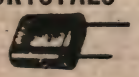
Stk#	Description
CD-180	Ceramic Disk Capacitors 10 pcs of 18 different values. 180 pcs total
CE-180	Electrolytic Capacitors 10 pcs of 18 different values. 180 pcs total
CM-180	Mylar Bypass Capacitors, 10 pcs. of 18 different values. 180pcs total
TP-180	Miniature Trim Pots 10 pcs of 18 different values. 180 pcs total

COLECO JOYSTICKS



$2.50 EACH
10/$17.00

CRYSTALS



Frequency	Case	Price
4 OMHZ	HC18	$1.25
6 OMHZ	HC18	$1.25
8 OMHZ	HC 18	$1.25
10 7MHZ	HC 18	$0.75
14 318MHZ	HC 18	$1.25
18 432MHZ	HC 18	$1.25

VOLTAGE REGULATORS



7805 5v 1.5 amp
7812 12v 1.5 amp
7824 24v 1.5 amp
7905 — 5v 1.5 amp
7905 — 5v 1.5 amp
7912 — 12v 1.5 amp
$.43 Each

LOW PROFILE SOCKETS (TIN)

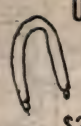


# OF PINS	PRICE
8	$.08
14	$.10
16	$.12
18	$.15
20	$.18
22	$.18
24	$.20
28	$.25
40	$.30

ELECTRONIC PIEZO BEEP BUZZER

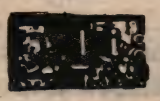
Special — 2/$1.00
7/8" Diameter element on plasting mounting. Originally used in Radio Shack telephone as the ringer.
Stk. #PZO-78 ..... $.75

ULTRAVIOLET TUBES GOOD FOR EPROM ERASERS



110 VAC
$2.25 ea. — 10/$15.00

8" DRIVE POWER SUPPLIES $24.50



8" DISK DRIVE POWER SUPPLY
Heavy duty supply can run up to 4 drives. Enclosed frame Iput 117VAC. Output: 5VDC @ 7 Amps: +24VDC @ 6 Amps. −24VDC @ 6 Amps.
Stk #PS-8 ..... $24.50

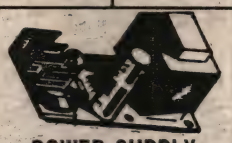
BUILD YOUR OWN EPROM ERASER



115VAC BLACK LIGHT (ULTRA VIOLET)

115 volt ultra violet light, with lamp, ballast and in-line cord switch. Just build enclosure to finish.
Stk. #EPB-125 ..... $12.50

POWER SUPPLY



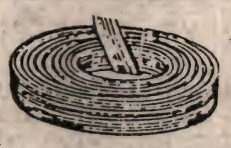
General purpose compact power supply. 3 outputs: +5V @ 1 Amp, +12V @ 1 Amp, & +24V @ 1 Amp. Power Transistors mounted on a heat sink. 2"x4" w/transformer. Stk #PS-3P $4.49

VITEK CABLE CONVERTER



Model No. TC-1M converter. Both Mid-Band & VHF frequencies. Has built in power supply. Units are new & in working cond.
Stk. #TC-1M $9.95

RIBBON CABLE



9 conductor Spectrastrip with red market stripe. 250' per roll. 28ga. stranded wire.
WRIB-9 ..... $10/Roll
20 conductor spectrastrip with red market stripe. 100' per roll. 28ga. stranded wire.
WRIB-20 $.30/ft. or $25/roll
34 conductor spectrastrip with red marker stripe. 100' per roll 28 ga. stranded wire.
WRIB-34 $.45/ft. or $35/roll

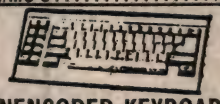
1000 PIECE RESISTOR ASS'T ALL SIZES & VALUES

Stk. #RES-1000 ..... $3.00

STEPPER MOTOR

for robotics, precision movement application etc.
(Unifilar Wound)
5 VDC 3½ Watts 7.5°X
48 Step/Rev. 28 RPM
Stk. #MO-5 ..... $3.50

UNENCODED KEYBOARD



Full size kybd. w/number pad. 70 keys w/LED power indicator. Orig. from dumb terminals. New!!! Mfg. by Hi-Tek.
Stk. #Kybd-70 ..... $9.95

ATARI GAMES



ATARI GAME ROMS
An assortment of 10 Atari game ROMs. Simply open any Atari cartridge & replace the existing ROM with a new one. Play another 10 games instantly.
Stk. #ROM-10 ..... 10/$2.50

XEROX 1810 Power Transf.



$6.95
Stk. # WTN-1810
Extremely Hard To Find!!!

IBM PC-JR REPLACEMENT POWER SUPPLY



Stk #WTN-4860 ..... $16.95

ATARI REPLACEMENT POWER SUPPLIES



11.5 VDC @ 1.95 AMP
Stk. #WTN-195 ..... $6.75

12 POS KEY PAD

Stk# Kypd-12
$1.50

MAGNETS



2" Bar Magnet with Tape On One Side
2/$1.00

COMPUTER SPEAKERS



2.25" 8 ohm .25 watts. This is the same speaker that IBM uses. Excellent for computer builders.
Stk. #SPK-8 ..... $.65

ELPAC POWER SUPPLY

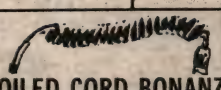


For TV game & computer peripheral equipment. Rated 110VAC input. Ouput +5VDC @ 860MA. +12VDC @ 300MA. & −12VDC @ 300MA. Model #WM-113.
Stk. #WTN-113 ..... $6.75

TANTALUM CAP ASS'T

10 pcs
$2.00

COILED CORD BONANZA



4 Conductor coiled cord. Black vinyl jacket. Extends to 6 ft. No connectors on either end.
Stk. #CC-000 ..... 3/$1.00
4 Conductor coiled cord. Black vinyl jacket. Extends to 6 ft. Phone connector on one end and no connector on the other.
Stk. # CC-020 ..... 2/$1.00
4 Conductor coiled cord. Grey vinyl jacket. Extends to 6 ft. Used as keyboard cable. Phone jack to 5 pin din connector.
Stk. #CC-100 ..... $4.00

WIRE



TEST PROBE WIRE
18 Guage rubber coated. Red, black, white or blue ..... 100'/$13

HOOK-UP WIRE
24 Guage stranded cond. 22 guage solid conductor, your choice ..... 100"/$2

WIRE WRAP WIRE
30 Guage solid cond. Choice of colors. Wir-30 ..... 100'/$2.50

3 VOLT LITHIUM BATTERY



Used as battery back-up on most multi-function cards.
Mallory BR-2325
$1.00 EACH — 10/$5.00

CERAMIC DISC CAPACITOR ASS'T

200 pcs
$4.00

TV-GAME SWITCH

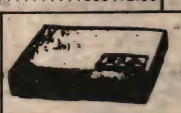


$.65 EACH
OR 10/$4.25

ULTRA-SONIC TRANSDUCER

Don't know what these came out of but this is a doozey of a device. Unit is an aluminum cylinder containing a piezo-ceramic with an adjustable coil in parallel. Frequency is 24 khz. Can be used in many ultrasonic circuits.
Stk. #ULT-58 ..... $2.25

TOCOM 55 PLUS CABLE TV CONVERTER



55 CHANNEL CONVERTER
Complete Unit — $24.50
Mainboard — $7.50
Power Supp. — $4.50
We Received A Large Shipment Of These Cable Converters. Good Savings!

LOLIR LECTRONICS CORP.

13933 N. CENTRAL EXPRESSWAY
SUITE 212
DALLAS, TX 75243
214-234-8032 — 214-234-8056

TERMS: Check or Money Order. COD's Add $1.90. TX Res. add 6% Tax. Please add $3.50 shipping. All out of stock items will be refunded.



WOLFF COMPUTER & ELECTRONICS

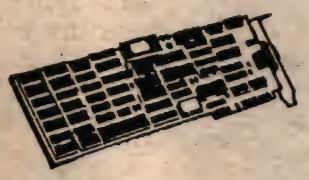
(214) 423-8097
901 E. Plano Pkwy #117
Plano, Texas 75074
MON-FRI 10am to 7pm SAT 10am to 6pm

- Prices DO NOT include shipping
- VISA & MasterCard add 3%
- COD's add $1.90
- Checks accepted, allow 10 days to clear
- Dallas MTA add 6 1/8%
- Other Texas residents add 5 1/8%
- Prices subject to change without notice
- We reserve the right to limit quantities

CARDS & BOARDS:

floppy controller w/cable..2.....$ 49.00
floppy controller w/cable..4.....$ 59.00
Western Digital hard-disk
controller w/cables.....$149.00
serial card.....$ 39.00
parallel card.....$ 36.00
TTL monochrome graphics card
w/parallel port.....$119.00
game I/O card.....$ 49.00
color card (Hercules Compatible)..$ 89.00

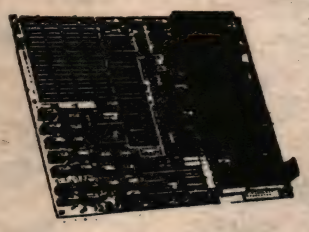
Bizcomp internal modem 300/1200...$189.00



multifunction card w/ØK
upgradable to 384K, serial and
parallel ports, clock calendar,
software for RAM disk and print
spooler, w/cables.....$109.00
same card w/384K.....$159.00

multifunction card w/2 serial
ports (second is optional)
parallel and game ports,
clock calendar, software.....$109.00

multifunction card w/floppy
controller, serial, parallel
and game ports, clock calendar
software for RAM disk & print
spooler, w/cables.....$139.00



Magic Video display card w/TTL,
RGB and composite monitor
support, light pen interface,
5 graphic & 4 text modes,
640X200 color, 640X352 mono-
chrome, 640X400 color graphic..$189.00

Super XT motherboard w/640K,
8 slots, 4.77 MHz clock.....$229.00

X-Turbo motherboard w/8 slots,
640K, 2 clock speeds @ 4.77
and 7 MHz (software select)
fully compatible.....$395.00

COPYIIPC CARD $89.00

NEC PROCESSOR REPLACEMENTS:

Speed up your instruction set by 33%

8086 5 MHz.....$19.95
8 MHz.....$24.95
8088 5 MHz.....$14.00
8 MHz.....$19.00



MATH CO-PROCESSORS:

8087 5 MHz.....$139.00
8 MHz.....$159.00



DESIGN YOUR OWN COMPATIBLE!

SUPER XT SYSTEM $875

* disk plus I/O card w/serial, parallel & game ports, clock calendar and floppy controller
* two DSDD 5¼ half-height drives
* color graphics or monochrome card
* amber or green, TTL or composite monitor
* slide-out or flip-up PC case
* 135W hard disk ready power supply
* 5150 style keyboard
* 8 card slots
* 640K RAM
* 4.77 MHz operation
* optional math co-processor
* fully tested
* fully compatible

TURBO XT SYSTEM $1095

* disk plus I/O card w/serial, parallel & game ports, clock calendar and floppy controller
* two DSDD 5¼ half-height drives
* color graphics or monochrome card
* amber or green, TTL or composite monitor
* slide-out or flip-up PC case
* 135W hard disk ready power supply
* software selectable clock speed: 4.77 MHz or 7 MHz turbo speed
* 8 card slots
* 640K RAM
* optional math co-processor
* fully tested
* fully compatible

ADD OR SUBTRACT TO CREATE YOUR PERFECT SYSTEM

Introducing the latest addition to the pack!

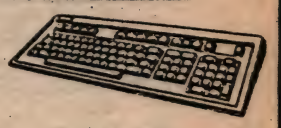


TURBO AT SYSTEM
$2195

* one 1.2 Meg floppy drive
* one 360K floppy drive
* 640K upgradable to 1 Meg
* 8 MHz speed
* color or monochrome card
* standard AT footprint motherboard
* floppy & hard drive controller
* 200W AT power supply
* amber or green, TTL or composite monitor
* standard AT look-alike case
* AT look-alike keyboard
* optional 80287 math co-processor

PC ADD ONS...KEYBOARDS:

5150 style.....$69.00
5151 style.....$99.00
AT look-alike....$89.00



PC ADD ONS...MONITORS:

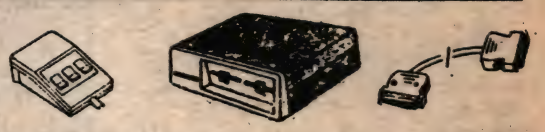
TTL, amber or green.....$119.00
composite amber or green.....$ 99.00
color RGB 640X200, switches amber/green..$369.00
color RGB 690X400, switches amber/green..$469.00

PC ADD ONS...POWER SUPPLIES:

135W side switch.....$ 79.00
200W side switch.....$109.00



PC ADD ONS...MISCELLANEOUS:



slide-out or flip-up case.....$ 59.00
joystick.....$ 22.00
parallel printer cable.....$ 12.00
modem cable.....$ 13.00
Logimouse.....$ 95.00
Mouse System w/PC Paint.....$139.00



SOFTWARE

HIGH PERFORMANCE...LOW PRICE

DAC SOFTWARE, INC.

DAC Easy Accounting.....$ 62.95
DAC Easy Payroll.....$ 47.95
DAC Easy Word.....$ 47.95
(two new additions)

AMERICAN SMALL BUSINESS COMPUTERS

Prodesign II...(fantastic CAD program).....$275.00

HYPERGRAPHICS CORPORATION

Ole On-Line Encyclopedia for DOS.....$ 62.95
Ole BASIC..(reference and tutorial).....$ 62.95
Ole Computer Literacy..I & II.....$ 35.95/ea
Ole Data Communications.....$ 62.95

PAPERBACK SOFTWARE, INC.

Numberworks	$37.95	Draw It	$ 27.95
Executive Writer	$62.95	Executive Filer	$ 47.95
Paperback Writer	$37.95	Paperback Speller	$ 37.95
My ABC's (3-7yr)	$17.95	VP-Planner	$ 92.95

IRWIN 10 Meg tape back-up unit
(sold only as part of a system)



$549

HARD DISK W/CONTROLLER

10 Meg.....$399.00
20 Meg.....$529.00



JOIN THE WOLFF PACK...
WE MAKE HOWLING GOOD DEALS!

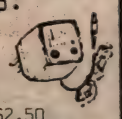


USED EQUIPMENT

Eagle III PC	$ 500.00
North Star 8080 CPU/Esprit terminal	$ 500.00
Kaypro II system	$ 550.00
Kaypro IV system	$ 650.00
Radio Shack Mdl I	$ 400.00
Radio Shack color computer	$ 200.00
TI 994A system...NEW!	$ 89.00
Silent 700 KSR terminal	$ 129.00
IBEX 2200 system	$ 450.00
Morrow Design CP/M system	$ 600.00
Micro Processor CP/M-86 system	$ 450.00
RB5X robot (complete)	$ 900.00
TRS-80 line printer II	$ 200.00
COMPAQ DeskPro 2...(ALMOST NEW!)	$2100.00
IBM-XT w/10 Meg hard drive	$1700.00
Apple III system	$ 750.00
Xerox Memory Writer Mdl 6010...NEW!	$ 450.00
Xerox 820-2, 5¼" drives, manuals & software	$ 800.00

CONDITIONS & GUARANTEES VARY. MANY SYSTEMS INCLUDE LOTS OF BOOKS AND SOFTWARE! ALL ARE SOLD ON A FIRST COME BASIS.

POWER SUPPLIES:



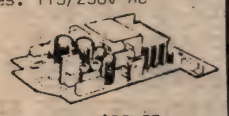
Fox AC adaptor
input 117 AC
output 12V AC 600 ma
.....$2.50

18V supply 4½ x 4 x 1
+ 5V @ 1.2A
+12V @ .5A
- 5V @ .3A
.....$4.95

Diskdrive supply
+ 5V @ 4A
+12V @ .8A
-12V @ 8A
-12V @ .3A
.....$24.95

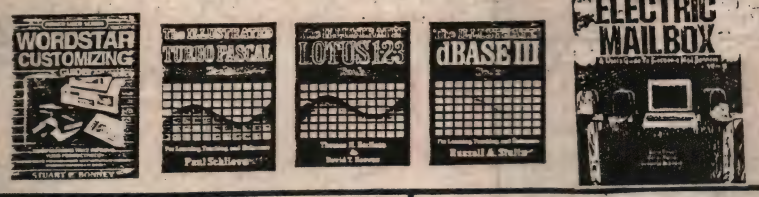
DC power supply
+ 5V @ 5A
+12V @ 2.8A
-12V @ 2.5A
.....$29.00

Astec supply 6½ x 5¼ x 4
input voltages: 115/230V AC
+ 5V @ 6A
+ 9V @ 1.5A
+12V @ 2A
+17V @ 1.5A
+34V @ 2.25A
.....$29.00



WE CARRY BOOKS BY PLANO'S OWN WORDWARE PUBLISHING:

MS/PC DOS..dBASE II & III..SYMPHONY..LOTUS..UNIX..pfs..AUTOCAD
MULTIMATE..WORDSTAR..C PROGRAMMING..Educational Software & MORE



VOLTAGE REGULATORS

7805T = 5V
7812T = 12V
7815T = 15V
7824T = 24V



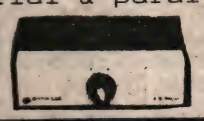
45¢

AB SWITCH BOXES

RS-232

39.00

serial & parallel

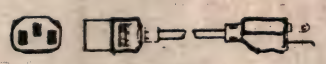


WE MAKE CUSTOM CABLES!....CALL FOR QUOTE









Signalman Mark XII modem.....$299.00

Dual 8" drive cases w/power supply.....$149.00
Dual 5¼" drive cases (surplus).....$ 25.00

Diskette storage boxes....35 unit.....$ 7.00
....70 unit.....$ 8.50
...100 unit.....$ 12.50

Diskettes 5¼ (box/10).....$ 10.00
Diskettes AT (box/10).....$ 30.00

5" muffin fans (deinstalled)..120V.....$ 5.00
5" open fans.....$ 5.00
3½" Sprite fans..115V.....$ 4.00

numeric keypads w/serial output.....$ 4.25
terminal strips: 4,6,8,10,12,15 position.....$ .59
edge connectors bus 100 connector.....$ 2.00
86 pin connector.....$ .75
70 pin connector.....$ 1.60
3-prong AC cables for PC monitor.....$ 2.00
fuse/switch assemble w/3-prong AC pulg.....$ 1.50
rubber feet...4/strip.....$ .49
Y power cables.....$ 4.00





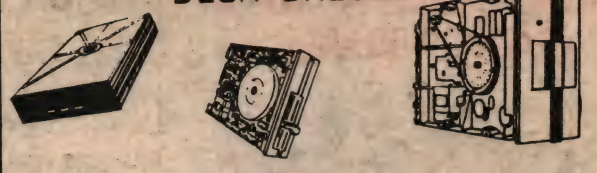






and MUCH MORE!

DISK DRIVES

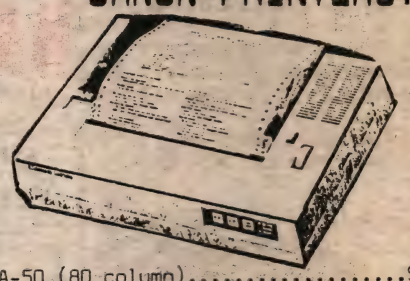


Qume half-height double side.....$69.00
Shugart 455 96TPI double side.....$99.00
Shugart 801 8" single side..NEW.....$79.00

10 Meg half-height hard disk.....$249.00
20 Meg half-height hard disk.....$379.00

MANY EXCELLENT USED AND REFURBISHED HARD DISK AND FLOPPY DISK DRIVES IN STOCK!!

CANON PRINTERS!



Mdl A-50 (80 column).....$389.00
Mdl A-55 (wide carriage).....$549.00
Mdl A-40 (140 cps).....$269.00
Mdl BJ-80 (220 cps).....$479.00

* self-test mode
* near letter quality
* bi-directional printing
* full Epson/IBM character set, including graphic
* parallel interface
* friction or sprocket

RAM CHIPS



64K/150 ns.....$10.00/set-9
256K.....$36.00/set-9

GREAT SURPLUS DEAL!
7400 series chips.

SWIVEL MONITOR STANDS

$14.00



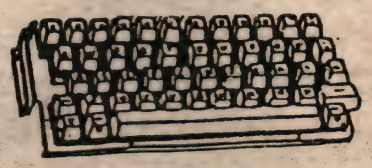
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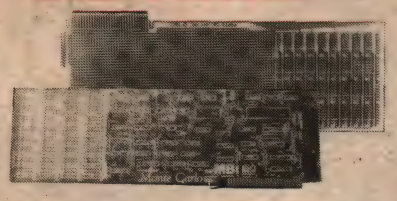
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HEXPACK*** A workalike copy of the famous AST SIX-PACK , WITH UP TO 384K RAM, Clock, Calendar and Serial and Parallel ports. 100% IBM and AST compatible, complete with schematic, parts placement and assembly data.....$29.95
Optional complete manual and software diskette....$8.95

MONTE CARLO CARD*** One of the best multifunction cards we have ever seen. This one takes either 64K or 256K RAMS in any combination for up to 1 Mbyte on board. (640K DOS accessble, balance subroutine accessed) PLUS two game ports, Clock, Calendar and Serial and Parallel ports. Clearly an awe inspiring array of functionality on a single card. Complete with schematic, parts list and placement diagram.....$34.95
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MONOCHROME GRAPHICS*** A workalike copy of the very nice HERCULES mono card, with static RAM on board. With all assembly data.....$29.95

DISC CONTROLLER*** A ¼size card for the short slot and portable use. 100% compatible, 1-4 drives complete with assembly data.....$19.95

DISC CONTROLLER*** A ½sized card for regular slot that is 100% compatible, runs 1-4 drives.....$14.95

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KRAM CARD*** We took a 512K card and rewired it for 256K RAMS. It now has four times the memory or 2 MBYTES. It closely follows the function of the popular JRAM card as all this type do, and also shares partition ing parameters to the extent that it will run the JRAM software or other similar programs. RAM Disc Drives are very easy to delineate. With all assembly data.....$34.95

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MEMORY PROTOTYPE CARD. This unique card has a memory array at one end. 36 16 pin sockets are placed in copper on board with all bussing in common, but with CAS, RAS etc brought out row by row and column by column so that either 64K or 256K RAMS can be quickly wired in. A 0.1 bypass cap is on each IC as well. The remaining ¾ of the board is 100% WW holes with a DB-25 and DB-9 footprint on one end.....$24.95

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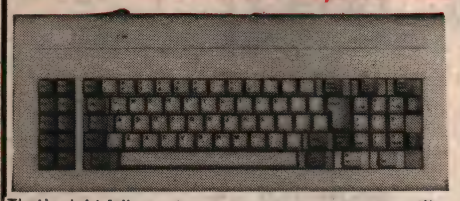


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+5VDC @ 5.5A +12VDC @ 4A −12VDC @ 0.3A

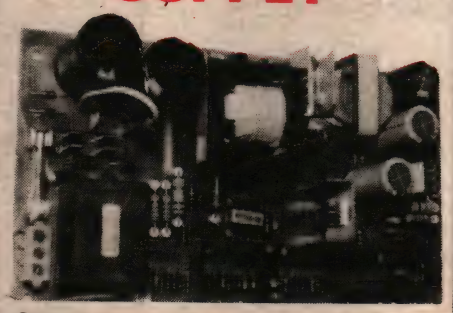
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One of the nicest open frame IBM type switching power supplies we have ever seen. Came from the defunct NCR IBM compatible, runs the whole thing, has +5V-7A, +12V-3A, -5, -12-¼A. A very good unit for starter system.

a real Steal at.....$39.95

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We have the nicest case of all the various competing cases, ask any friend who has bought someone else's case and then has seen ours. The lid is hinged with pushbutton access. The back is cut for 8 XT slots and it comes with all the case back inserts for cards, card guides, blind disc filler plates, standoffs, feet, screws, all for .$59.95

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We also have an IBM 8 Slot/6502 Board dual duty case for making IBM look-a-like 6502 systems.....$79.95

MEGABOARD CASE, similar to the above, but no pushbuttons or hardware, from DTC in Dallas Texas. A stronger US made case, but less finishing parts. Fits the MEGABOARD exactly with side cut extender, for back power supply.....$89.95

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IBM® XT COMPATIBLE 8 SLOT MOTHERBOARD

BARE PCB
With Manual & SCHEMATICS
$29.95

LAZY BOARD stuffed and wave soldered so you can save all that time soldering them up. All you need are the IC's memory, and BIOS and are set to go **$89.95**

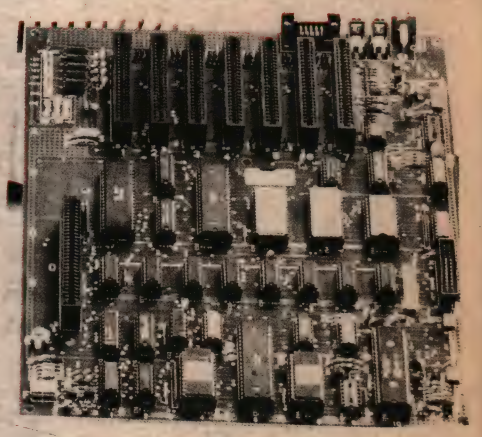


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OK
WITH BIOS

- 64K/128K EPROMS JUMPER SELECTABLE
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- SAME PCB SIZE AS IBM XT
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- 8087 MATH PROCESSOR, OPTIONAL
- 8 IBM COMPATIBLE EXPANSION SLOTS
- 4 DMA AND TIMER CHANNELS

CLONE e MOTHERBOARD

WIRED WITH 64K
$199



Ext 80 Col Card WITH 64K RAM $45.00

READ THIS

Yes, this is a clone of the ever popular IIe® computer, it has no software on it and we will not sell you any. It is 100% compatible and uses custom IC's that are of original design to work-a-like the real thing and the character generator and the mapping PAL also do not infringe any copyright. It is plug-in-card compatible and will run ext 80 column cards with 64K RAM for total RAM of 128K as well as all other similarly compatible cards. We STRONGLY urge you to only use this board for personal non-commercial use. Those who try to sell quantities of systems based on this board will get in trouble with the fEDS, unless you have a legal source of software(like IIe upgrade kits). We will only sell a max of two of this board to any one person, unless shown legal access to software. **FITS CASE KEYBOARD ON OPP PAGE**

HD SWITCHING POWER SUPPLY

185Watts, MADE IN THE USA by POWER ONE. This unit is BRAND NEW, NEVER USED, TESTED and very HEAVY DUTY. Fully enclosed, 13x5x2.5" with Push-on and screw terminals.....$49.95

+5V-25A
+12V-3.5A
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$18.95 NEW IN BOX TESTED

AC power cable (3 Wire) for above.....$2.50

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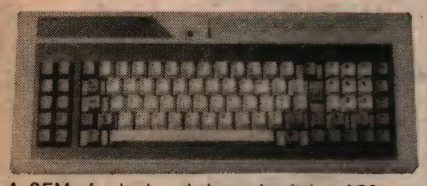
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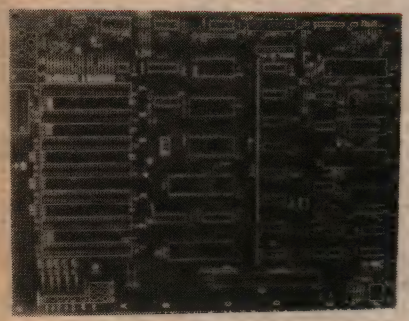
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A GEM of a keyboard, in a nice beige ABS case. Lets you build an IBM look-a-like that runs like a IIE with 2 drives in case using our $69.95 case on this page. This KB is fully IIE compatible, with all functions..... $149.95

MOTHER BOARD



100% IIe® Compatible, for those of you who wish to build a clone of the very popular APPLE IIe®. This board is a reverse engineered copy of the IIe® and is 100% compatible. We have the motherboard and the custom ICs only. All other parts are widely sold. The custom ICs are workalike chips that do not infringe any copyrights. The software for operating the board must be obtained elsewhere as we do not have it for sale. When we say 100% we mean it.

A very good buy at	$49.95
Custom IC set(2)	$49.95
Keyboard encoder (AY3-3600)	$14.95
Character generator, UA.C	$14.95

IIe® ABS PLASTIC CASE

$49.95



This case is made to fit the Mother Board listed here for making IIe® clones and it makes a very nice looking copy. There is just enough difference to avoid design infringement. The case also has no brand names or other marks on it.

A good buy at $49.95

IIe® MATRIX KEYBOARD

$69.95

This keyboard fits the above case and has 100% clone compatibility, it will allow operation of all IIe® commands. Another bargain at $69.95





The famous APPLE-SEED and APPLE-SEED II are the books that see all, tell all on the various APPLE clone motherboards and peripherals. They are well worth the $12.95 that we are asking. And KOSMIC has been at it again on IBM clone motherboards and peripherals and has composed the one and only "BIG BLUE SEED", it goes into greater detail on a smaller number of motherboards and peripherals (over 20 and growing) and will help you to build many of them at a saving.

APPLE-SEED I Motherboard book	$12.95
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ACCUFEEL KEYBOARD



This is a detached keyboard in an ABS case with a 6" curly cord to connect ot to 6502 based machines. It used a serial data format for error free transmissions down the curly cord with a serial to parallel to converter board on the end that is fully 6502/Apple compatible. Has auto repeat, beep, no beep. 10 user programmable macros, 50 preprogrammed macros, auto line number,. $149.95

FRANKLIN COMPATIBLE

PARTS

100Ns delay line	$6.95	0.1 Mono caps, 0.2"	$0.10
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MADE FOR TWO ½ HEIGHT DRIVES
SPACE FOR POWER SUPPLY, FAN ETC.

40 WATT POWER SUPPLY... $40.00
60 WATT POWER SUPPLY... $60.00

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8048

5v only

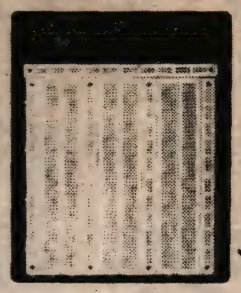


New Serial Parallel

$19.95

A great deal, this brand new ASCII keyboard came from AES DATA, one of the largest makers of word processors in the world. A novel circuit generates both serial and parallel ASCII out allowing use on both APPLE and IBM styles of system. The unit runs on +5V only, has Hall effect keyswitches and uses an 8048 micro for operation. The sculptured keytops are arranged in typewriter style for quick learning and are an attractive light beige color. We got them for 5% of the $169.00 that AES paid and so we can sell them dirt cheap and still make money. Completely new with 20 pin ribbon IDC connector and pinout for easy interfacing..... $19.95

Solderless Breadboard





Solderless prototyping boards are the best way to quickly breadboard up a circuit. The holes are made especially for IC's, resistors, and other small parts with 22-28 gage wire leads, takes WW pins too.

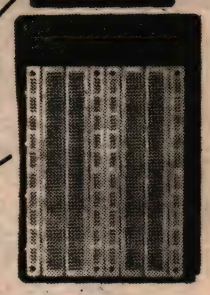
WB-106 ..... $39.95
3 IC strips, 5 power strips
4 Binding posts, Aluminum plate

WB-104-3 ..... $24.95
2 IC strips, 1 power strip
2 Binding posts, aluminum plate

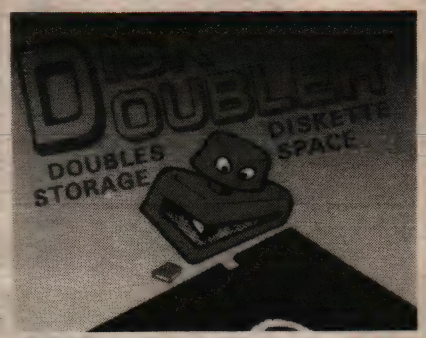
WB-108 ..... $49.95
4 IC strips, 7 power strips
4 Binding posts, aluminum plate

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2 IC strips, 4 power strips
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Disc Doubler



DISC DOUBLER..... $5.95

3 WAY SWITCHED SCOPE PROBE



We have other probes, ask for our mini-catalog

Fits All Makes & Model Scopes

1 ×1 *POSITION*
DC – 10 MHz
35 nS
55 p.F. + Oscilloscope input Capacitance
1 MΩ (Oscilloscope Input)
600 Volts DC Including peak AC,

2 ×10 *POSITION*
DC – 100 MHz
3.5 nS
Nominal 16 p.F.
10–60 p.F.
10 MΩ When used with oscilloscopes which have 1 MΩ Input.

3 *REF POSITION*
Probe tip grounded via 9 MΩ resistor,

CENTRONICS
RIBBON CABLE IDC CON.



Ribbon Cable Type Centronics and DB-25 Connectors

DB-25 Male	$2.49	DB-25 Female	$2.49
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As you know COLUMBIA has bit the dust. We have bought 5000 power supplies by POWER ONE, Rated at 135W and 150W dissipation. 100% good USA design. Brand new with full spec, all IBM voltages.

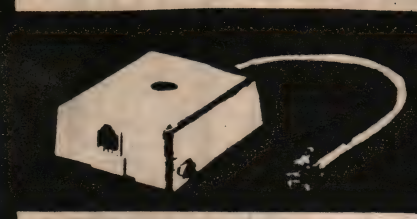
135W $49.95
150W $64.95

APPLE® BARE PC BOARDS® PRICE SLASH!

NEW LOWER PRICES

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Modem Spike Protector squashes spikes before damage can be done to your phone accessories. Response time (5 nanoseconds). 100% spike protection from line to line and line to ground. Exceeds telephone line standards for maximum high voltage protection. And easy to install.

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*ADD $2 SHIPPING & HANDLING.

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ALL NEW & PREMIUM NO RELOADS

PRICED PER EACH

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1/2" * 20 YARDS

1-6*	7**
4.75	4.50

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1-6*	7**
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NEC SPINWRITER, AMTEXT
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20/24, SONY 35
1/4" * 405'

1-6*	7**
4.75	4.50

* FREE SHIPPING ON 6 OR MORE RIBBONS

RIBBONS AVAILABLE FOR ALL OTHER MAKES OF PRINTERS

STAND-BY POWER SUPPLY



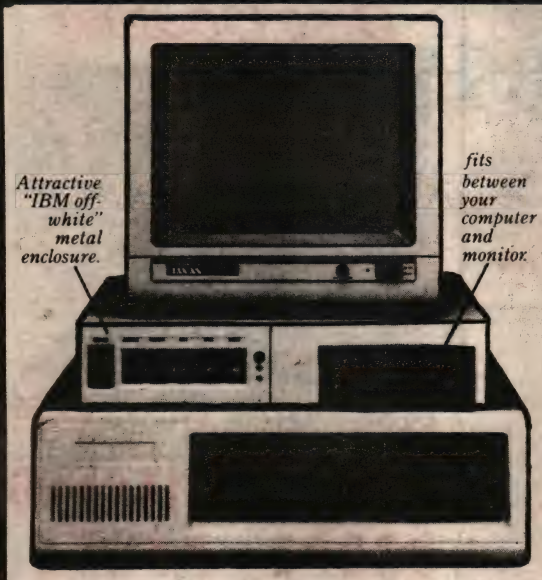
Automatically Supplies 117 VAC
DURING POWER FAILURE • **200 WATTS**

These Self Contained, STAND-BY POWER SYSTEMS are complete and ready to go. Just plug it in! The (4) four 3 prong outlets on the back make it easy to install and maintain a neat appearance. Line filtering is built in to protect equipment from surges and spikes. Low voltage cut off circuit is built in as well as the battery charger circuit.

$259.00

SIZES AVAILABLE TO 1000 WATTS * Please add $10 for shipping & handling

SOLA UPS AVAILABLE FROM 1 KVA TO 15 KVA



The Disk Drive Vault

Coming in two configurations that allow you to add an external drive to your computer system without having to change your computers internal power supply, or trying to find a place for it.

PE-2	**$195**
PE-1	**$169**

PE-2 comes with 6 outlets that have spike, surge, RFI/EMI, and noise filtering to protect your complete system. Each of the 6 outlets are individually switched from the front panel.

PE-1 is set in the same type box, but comes with only one main switch that controls the external drive. The PE-1 also comes with the same brute force line filter to protect the internal power supply and the hard disk circuitry from hazardous power line problems.

Both boxes come with internal power supplies that can handle 10 or 20 meg hard disks, floppy drives, or a tape backup drive.

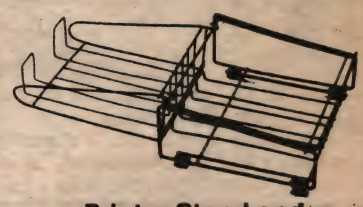
PLEASE ADD $4 FOR SHIPPING

Miniscribe Winchesters

These half height drives are of the highest quality for the most reliablity for your data. Uses only 14 watts. All drives come with cables.

Full height bezel add $14

10 meg 3212 $498
20 meg 3425 $629
$5 for shipping



Printer Stand and Receiving Tray

This unique printer stand has a loadable tray underneath for blank paper and a receiving tray for printer matter behind it. Sturdy steel wire construction to allow the printer to cool with its bottom vents. Polyester coated for long durable usage.

80 Column	**$34.88**
132 Column	**$44.88**

ADD $3 FOR SHIPPING & HANDLING

A Time Saver!

Parallel A-B
Switch Box
Switches all 36 lines
Connects 2 CPU's to 1 Printer
or 1 CPU to 2 Printer's

$65.88

ADD $2 SHIPPING AND HANDLING*

Western Digital
Hard Disk
Controller Card
for IBM's &
look a likes
Only 8.1" long

$154.00

ADD $2 SHIPPING AND HANDLING*

IBM Parallel cable & compats	6 ft	$19 *
RS232 25 pin shielded	7 ft	$19 *
36 Pin Centronics Shielded	10 ft	$29 *

CUSTOM CABLES AVAILABLE

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BASF™
5¼" DISKETTES
QUALIMETRIC

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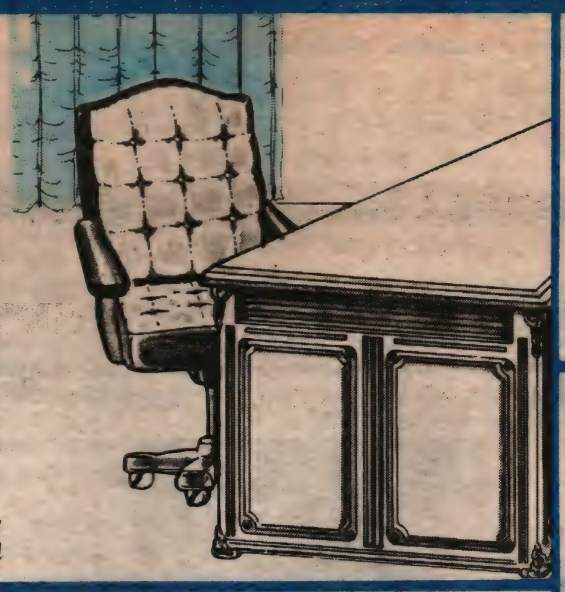
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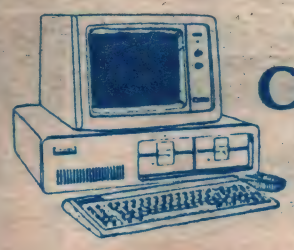
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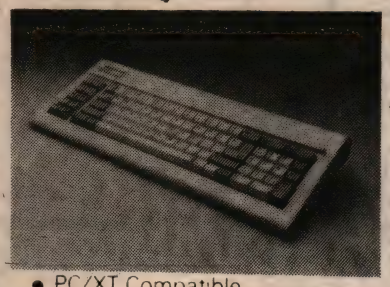
Price : $199

Nakai Case



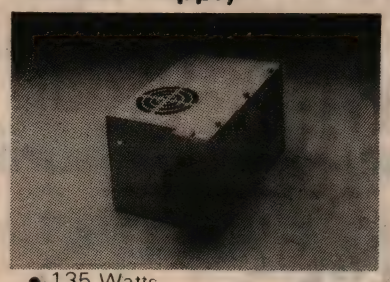
- Flip Top or Slide in
- Same Dimensions as PC/XT

Nakai Keyboard



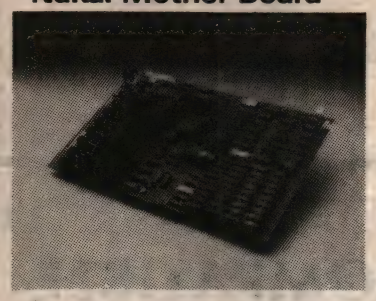
- PC/XT Compatible
- By Cherry of West Germany Or
- By Misumi of Japan
- Large Return and Shift Keys
- LED for Capital and Number Look

Nakai Switching Power Supply



- 135 Watts
- Side Switch
- 4 Floppy Power Plugs

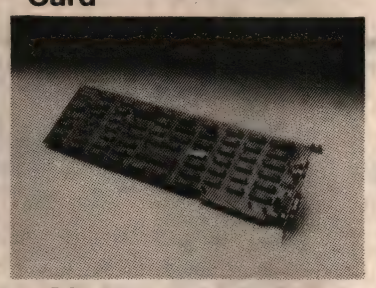
Nakai Mother Board



- 256 K Expandable to 640K on Board
- 4 Layer PC Board (Equal to IBM)
- (CPU) 4.77 MHz, 8088, 8087 Co-Processor Optional
- 8 Expansion Slots

Price : $239

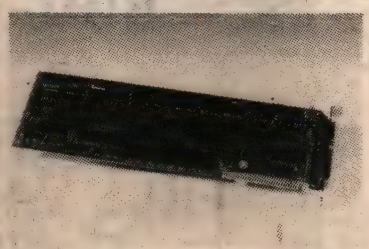
Nakai Color Graphic Card



- RGB Color, Composite, Monochrome Composite
- 4 Layer PC Board
- Text Mode: 40 Column x 25 Row 80 Column x 25 Row
- Graphic Mode: 320 Dot x 200 Line (Color, Black & White) 640 Dot x 200 Line (Black & White)
- Attribute: Reverse Video Blanking & High Light

Price : $105

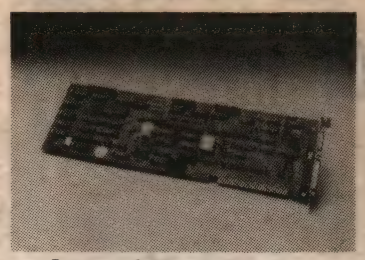
Nakai Monochrome Graphic Card



- With Parallel Printer Port
- Resolution: 720 x 348
- 4 Layer PC Board

Price: $109

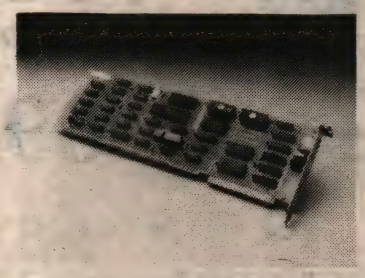
Nakai Multi I/O Card



- Controls 2 Floppy Disk Drives
- 4 Layer PC Board
- 1 Parallel Port
- 2 Serial Ports (1 Optional)
- Real Time Clock/Calendar
- Game I/O Port

Price : $135

Nakai Trans-Net Card



Nakai Trans-Net Card is a Comprehensive, High Performance, Low-Cost, and Easy-to-Use Local Area Network (LAN) for IBM PC/XT and Compatibles.

Nakai Trans-Net Local Area Network Transfers Data at 1 Million Bits Per Second Over A Twisted Pair Wire Cable Up to 4,000 Feet in Length, and as Many as 255 PCs can be Interconnected within A Network.

Price : $299

DD-01 Easy Ware, DD-02 Disk Notcher



DD-01 5-¼" DS/DD diskettes

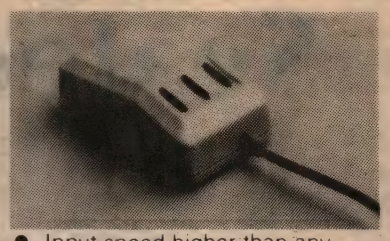
Price: $0.70

DD-02 DISK NOTCHER helps you save money by using the other flip side for backup copies.

THE DISK NOTCHER cuts write enable notch precisely & cleanly.

Price: $5.00

Nakai Mouse

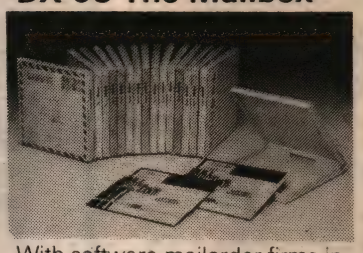


- Input speed higher than any devices
- No traditional grilled pad required
- Without using power supply adaptor
- No operating space limit
- IBM Compatibles.

With Software and Manual

Price: $99

DX-03 The Mailbox

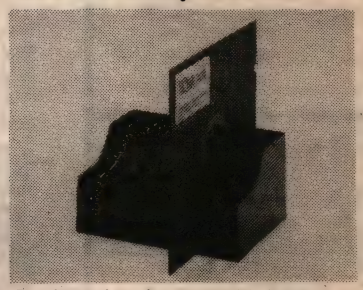


With software mailorder firms in mind, the MAILBOX was designed for mailing or transporting diskettes safely and inexpensively.

- Maximum 3 diskettes
- capacity.
- Rigid PS plastic structure.
- Mailing Label.
- 4 colors for your selection.

Price: $1.00

DX-08 Easy Holder

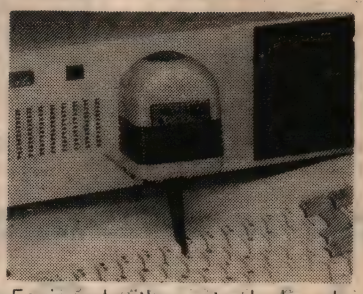


Designed to keep multiple diskettes programs both handy and in order, the EASY HOLDER is exceptionally convenient.

- Maximum 8 diskettes storage.
- Durable PS plastic body.
- Attractive color selection.

Price: $1.50

DT-51 Multifunction Vacuum Cleaner



Equipped with quartz clock and flashlight. Powered by dry cell or AC adapter. Ideal for cleaning IC sockets and hard to reach places.

Price: $12.00

DX-100N Deluxe Diskette File



- Diskette display filing system.
- Protective racks for diskette separation.
- Smoked PS plastic cover with lock.
- High impact plastic lid and base.
- Easy access handle for opening and carrying.
- One Hundred diskette capacity.

Price: $13.00

DX-100B Deluxe Diskette File



- Double row display filing system.
- Protective racks for diskette separation.
- Smoked PS plastic cover with lock.
- High impact plastic lid and base.
- Easy access handle for opening and carrying.
- One Hundred diskette capacity.

Pricve: $14.00

SS-25 Diskette Holder For 3-½" Disc



Special storage box for 3-½" diskettes.

- Capacity: 25 pcs diskette.
- High impact plastic lid and base.
- Easy access handle for opening and carrying.

Price: $8.00

SS-50 Diskette Holder For 3-½" Diskettes.

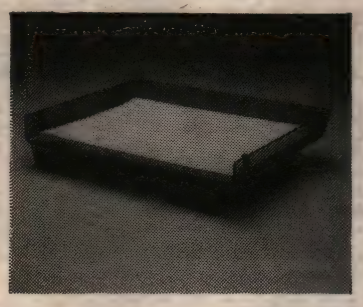


Special storage box for 3-½" diskettes.

- Capacity: 50 pcs 3-½"
- diskette.
- High impact plastic lid and base.
- Easy access handle for opening and carrying.

Price: $12.00

DT-01 CRT Tray

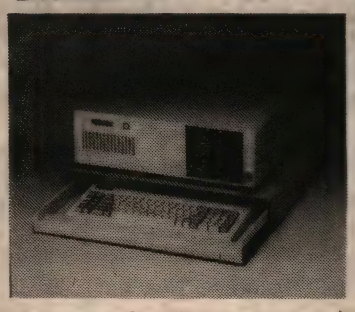


The way to bring your CRT up to peak effeciency! Fit this high impact plastic tray on top of CRTs to keep paperwork and printous neatly organized.

- Holds up to 500 sheets of paper.
- 4 rubber feet keep tray securely in place while letting air flow between the tray and CRT.
- Smart gray color.
- 4 expandable plastic hole to connect any accessories you need.

Price: $6.00

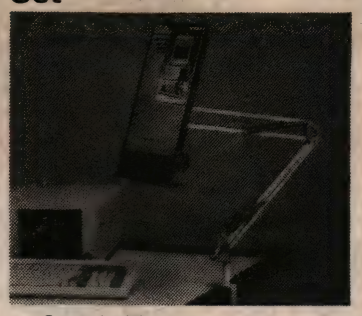
DT-21 DT Easy Drawer



Computer & CRT are supported by baked enamel, reinforced 20 gauge steel platform. The cantilever drawer, supported by ball bearing slides, holds a keyboard up to 2-¾"(h) x 19-¾"(w) x 9-½"(d), and extends to a lock position.

Price: $39.00

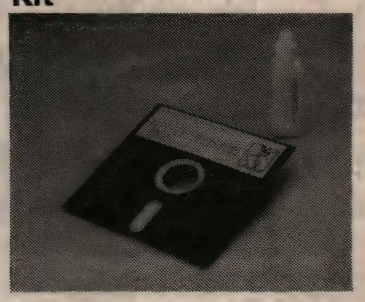
DT-32 Copy Holder With Adjustable Arm Set



- Copy holder set.
- Adjustable arm set, makes copy holder movable and easily adjustible to the position and angle most satisfactory to you.

Price: $15.00

FD-05 Head Cleaning Kit

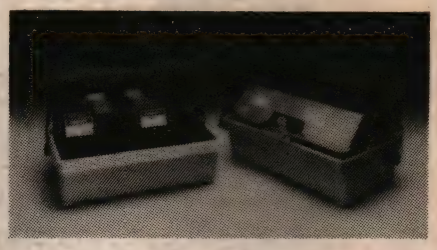


- Will not harm drive.
- Easy to use, insert like an ordinary diskette.
- Appropriate for both single and dual sided drives.
- 5-¼" cleaning diskettes.
- One bottle of cleaning solution.

Price: $5.00

SPECIALTY OF THE MONTH

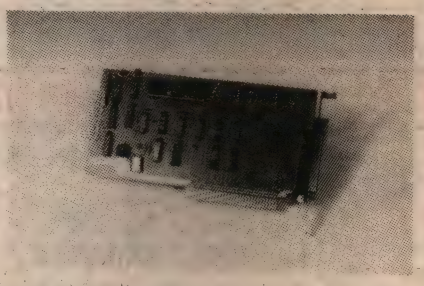
Accessories
DX-100B Diskett Box



- Double Row Display Filing System
- Smoked PS plastic Cover with Lock
- High Impact Plastic Lid and Base
- Easy Access Handle for Opening and Carrying
- Protect Up to 100 5¼" Diskettes

Regular Price : $14.00
NOW : $8.00

Nakai Disk Controller Card



- Controls 4 Disk Drives
- (2 internal and 2 external) 2 Layer PC Board

Price : $32

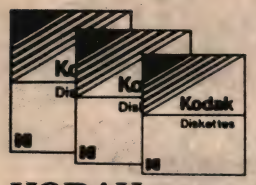
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George Eastman, the founder of Eastman Kodak and the man who made it possible for everyone to have a family album expressed Kodak's philosophy almost a century ago: make "good goods!"

That's why we're so pleased to add KODAK diskettes to our line.

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For those of you who want a "brand name" diskette with top-of-the-line quality...without paying through the nose, the choice is simple: KODAK.

Of course, there's a LIFETIME WARRANTY!

Except as noted, all KODAK diskettes are packed in boxes of ten with Tyvec sleeves, user ID labels and write-protect tabs. Bulk packed diskettes are labelled as KODAK diskettes and are packed in 4 bundles of 25 diskettes with Tyvec sleeves, user ID labels and write-protect tabs.

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5.25" DSDD-HD	$3.47 ea.	$3.15 ea.	
3.5" KODAK DISKETTES			
3.50" SSDD	$2.06 ea.	$1.87 ea.	
3.50" DSDD	$2.73 ea.	$2.48 ea.	
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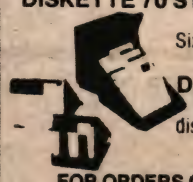
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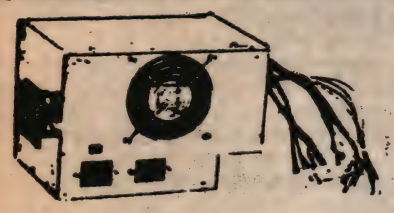
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TSCRIPT (#422) word processor for PC-JR only with Pascal source code
DICTIONARY (#378) Dictionary type spelling checker.
IV-ED (#415) Word processor - editor
LETTERWRITTER (#415) controls letter processing

SCREEN EDITORS

FRED (#83) Screen editor similar to IBM's Personal Editor
RV-EDIT (#190) Full screen editor from Bob Vollmer.
FOIL EDIT (#347) Full screen editor top to bottom and left to right.

TEXT PROCESSING TOOLS

PC-READ (#19¢) Program to determine clarity of text
FOGFIND (#378) reverses writing complexity using the "Fog index".
ROFFA 1.61 (#416) makes beautiful text formats with this processing tool.
QPARSER (#419) Public Domain version of this famous system.
WORDSTAR AIDS (#379) collection of the most useful utilities for the Wordstar user.

DATABASE PROGRAMS

PC FILE III (#5) most popular database progam from Jim Button
U—MIND (#133) Fast hashing makes this a dandy database. (Intelligent database)
DATABASE OF STEEL 3.1 (#214, 215, 267, 268) Database spreadsheet and expert system from Potomic Engineering.
NEWBASE (#233) Menu driven database for the beginner.
PC-DBMS (#383) A relational database management system that provides on-line help and screen editing functions.
ELSIE EXPERT SYSTEM (#398) Artificial intelligence shell to build a custom knowledge-base.
PDS*BASE (#396) Complete hierarchical data base system master/detail or mother/daughter type.
CREATOR (#339) create, report, and sort makes this a super database management system.
INFOBASE (#340) Forms driver database management system similar to INFOSTAR.

DATABASES

BOBCAT (#247) Small business database. Excellent
MFIND (#311) Database of over 2000 movies that can be searched in any category or you can add your own.

SPREADSHEETS

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PC-PAD (#406) Spreadsheet and address book program written in basic.

SPREADSHEET TEMPLATES

LOTUS 1-2-3 TEMPLATES AND MACROS (#140, #141, #165, #257, #289, #301-#304, #406, #414) Why spend hours of writing your macros when these are ready made. Modify them yourself.
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TIME AND MONEY (#251) Financial record keeping and analyze system
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PC-VT (#286) VT-100 Emulation
SYSCOMM (#338) Menu driven system allowing unattended file transfer.
RBBS +2.1 Become a SYSOP
FIDO NET - (#333) Bulletin Board System. perhaps the easiest to run.

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KLP 1.9 (#332) Kinetics linear programming system
MATH PAK (#394) Programs to teach and accelerate some math functions. BASICA

LANGUAGES

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LADYBUG 1.0c (#94) Logo like program.
XLISP 1.4 (#148) Lisp language interpreter.
LAXON & PERRY FORTH (#263, 264)
MVP-FORTH (#31, #32) Two disk set of Mountain Valley Press Forth.
3 FORTHS (#352) To modify or expand your own forth language. MVPFORTH, FORTH-H, and SEATTLE Computer's Forth.
PROLOG & UNIFORTH (#417) Complete with editor and documentation.
SNOCREST BASIC (#409, #410) two disk set, Real basic interpreter with manual. Can be used with a multi-user system.
TBASIC (#381) Tiny basic. A limited subset of BASIC. Could be placed on a chip.

PASCAL SETS

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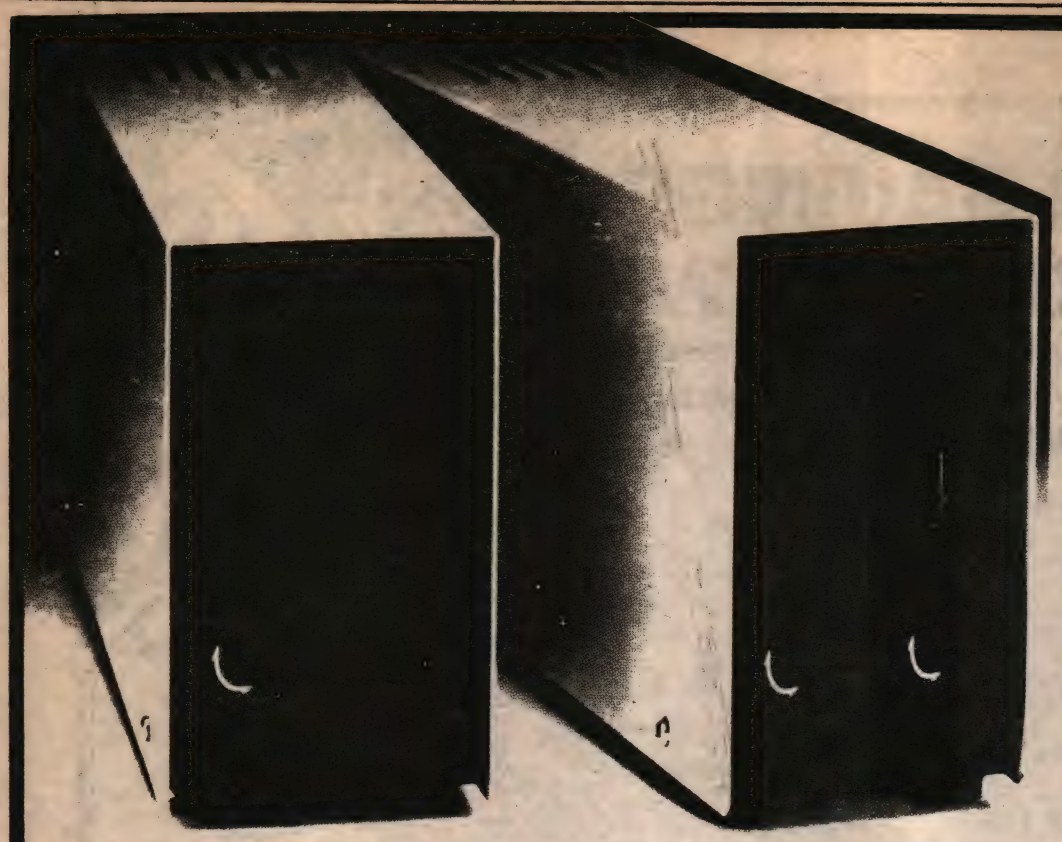
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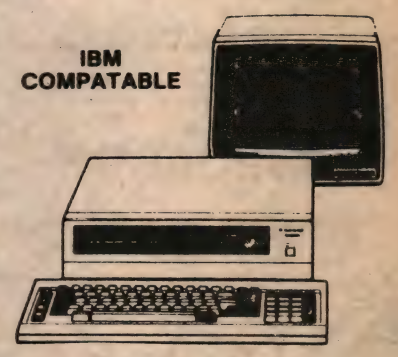
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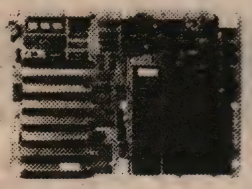
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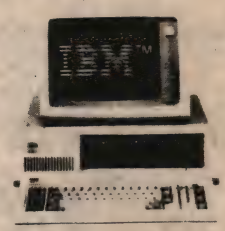
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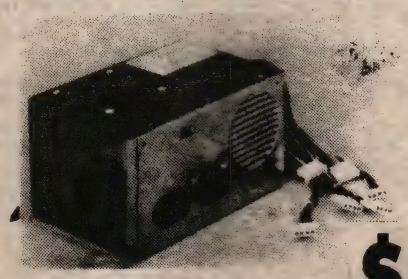
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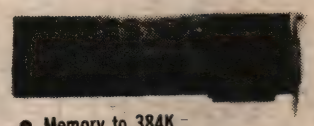
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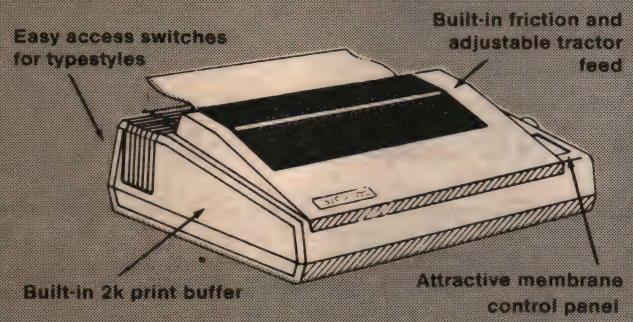
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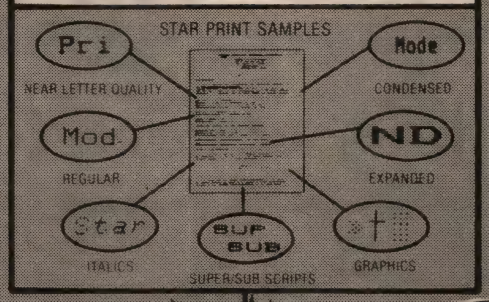


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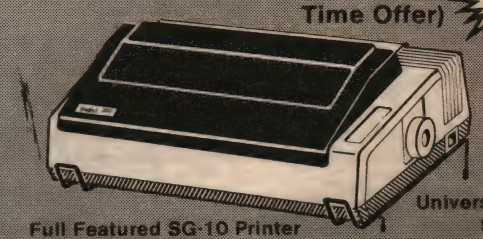


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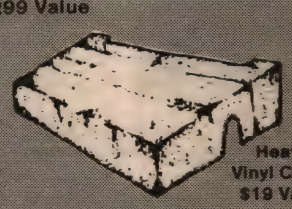
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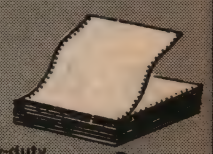
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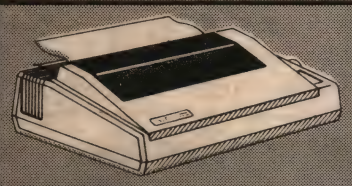
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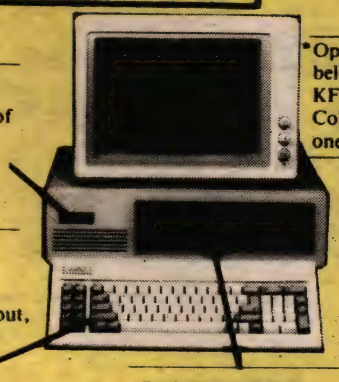
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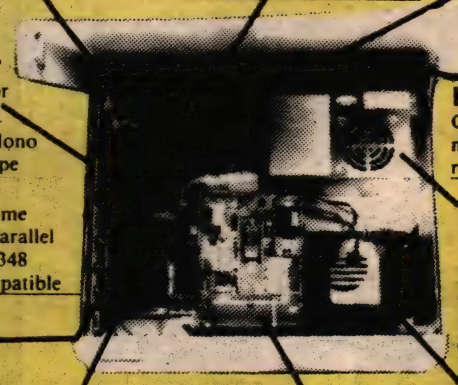
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MULTIFUNCTION CARD:
Drive controller. Parallel, Serial, optional second Serial, Clock Calendar W Battery Back-up. RAM disk. Spooler software.

***OPTIONAL PROCESSOR:**
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VIDEO CARD:
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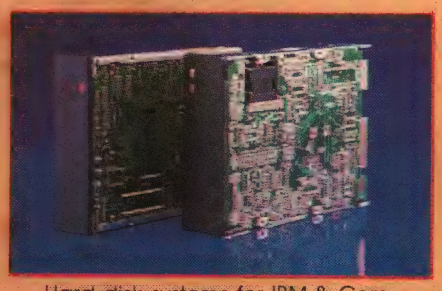
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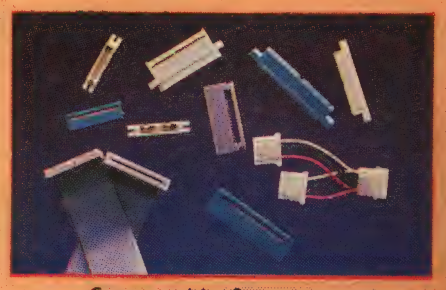
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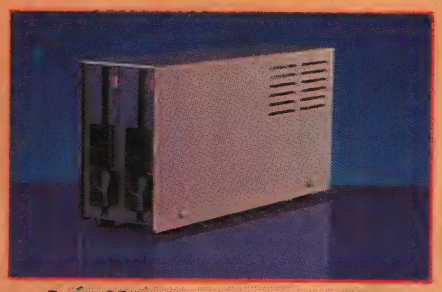


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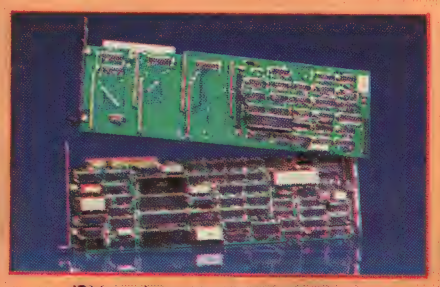


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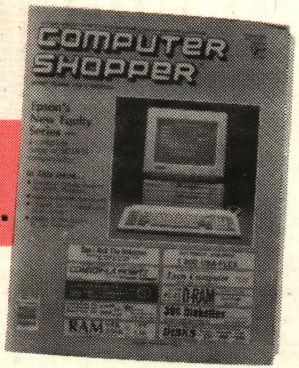
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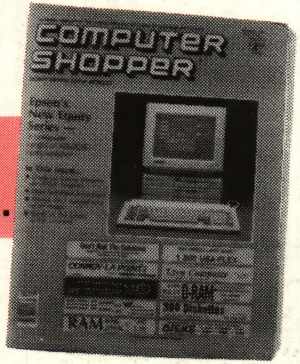
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